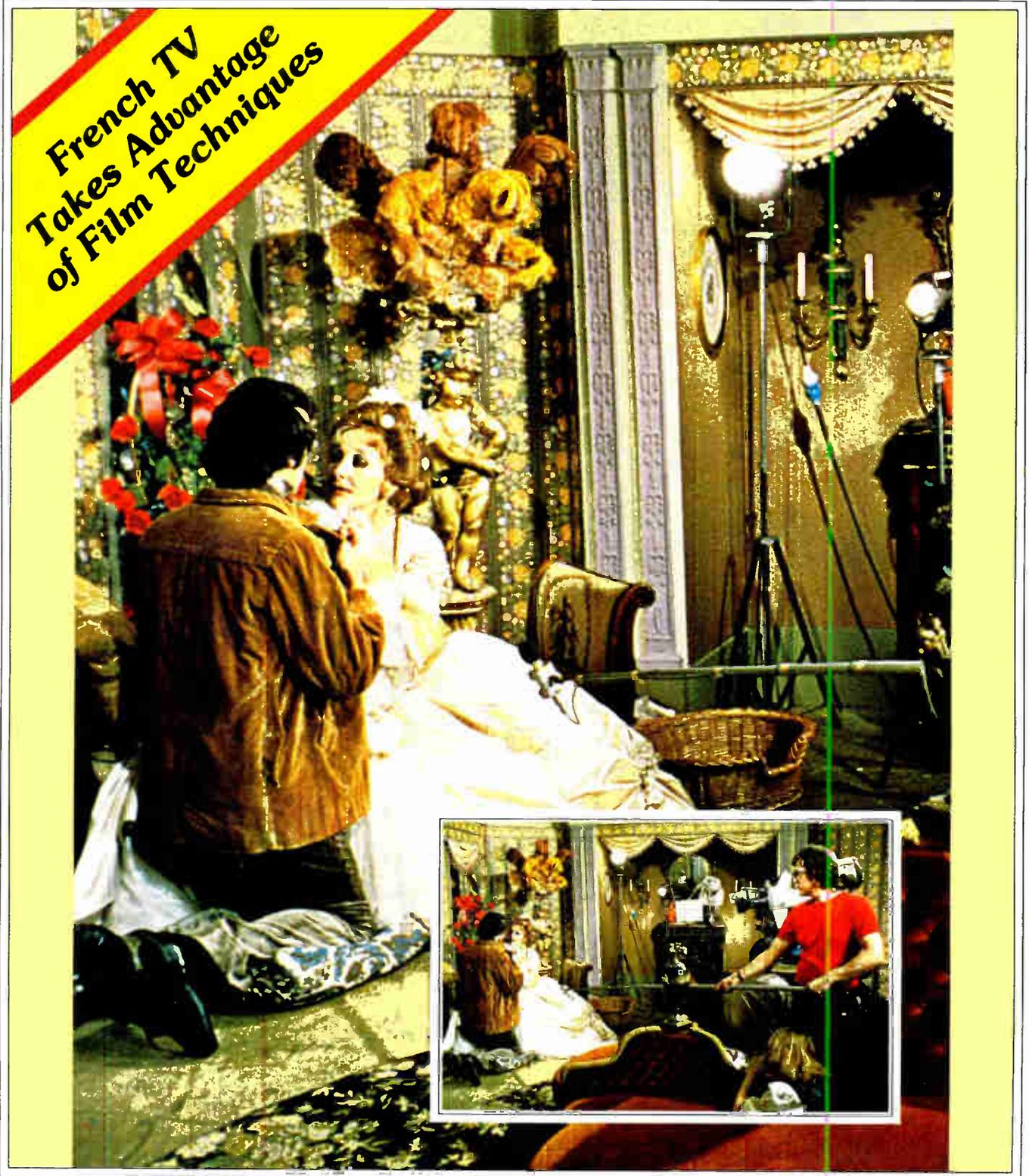


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BROADCAST COMMUNICATIONS is published monthly by Globecom Publishing Limited, 4121 West 83rd Street, Suite 216, Prairie Village, KS 66208.

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SUBSCRIPTIONS: BROADCAST COMMUNICATIONS is mailed free to qualified persons. Non-qualified subscriptions in the United States are \$36.00 for one year. Subscription rates outside the United States are \$50.00 for one year. Back-issues rate is \$5.00. Allow 8 weeks for new subscriptions. Allow 8 weeks delivery for change of address.

Controlled-circulation postage paid at Kansas City, Missouri.

BPA membership applied for.



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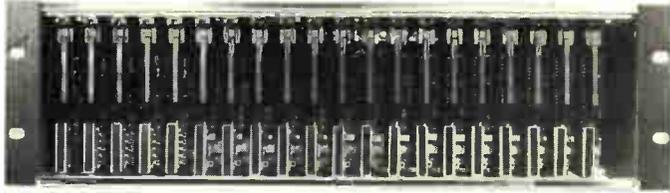
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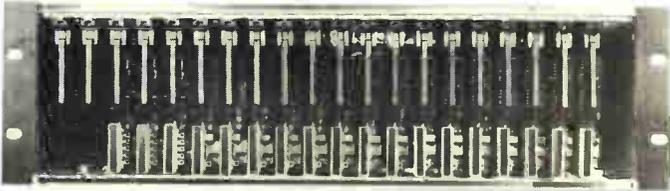
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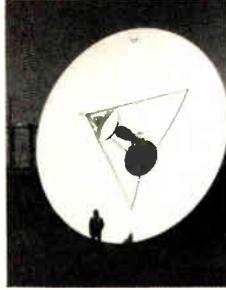
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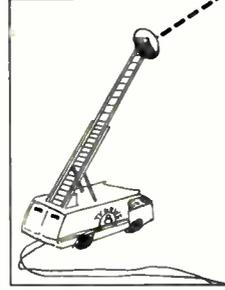
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THE COVER
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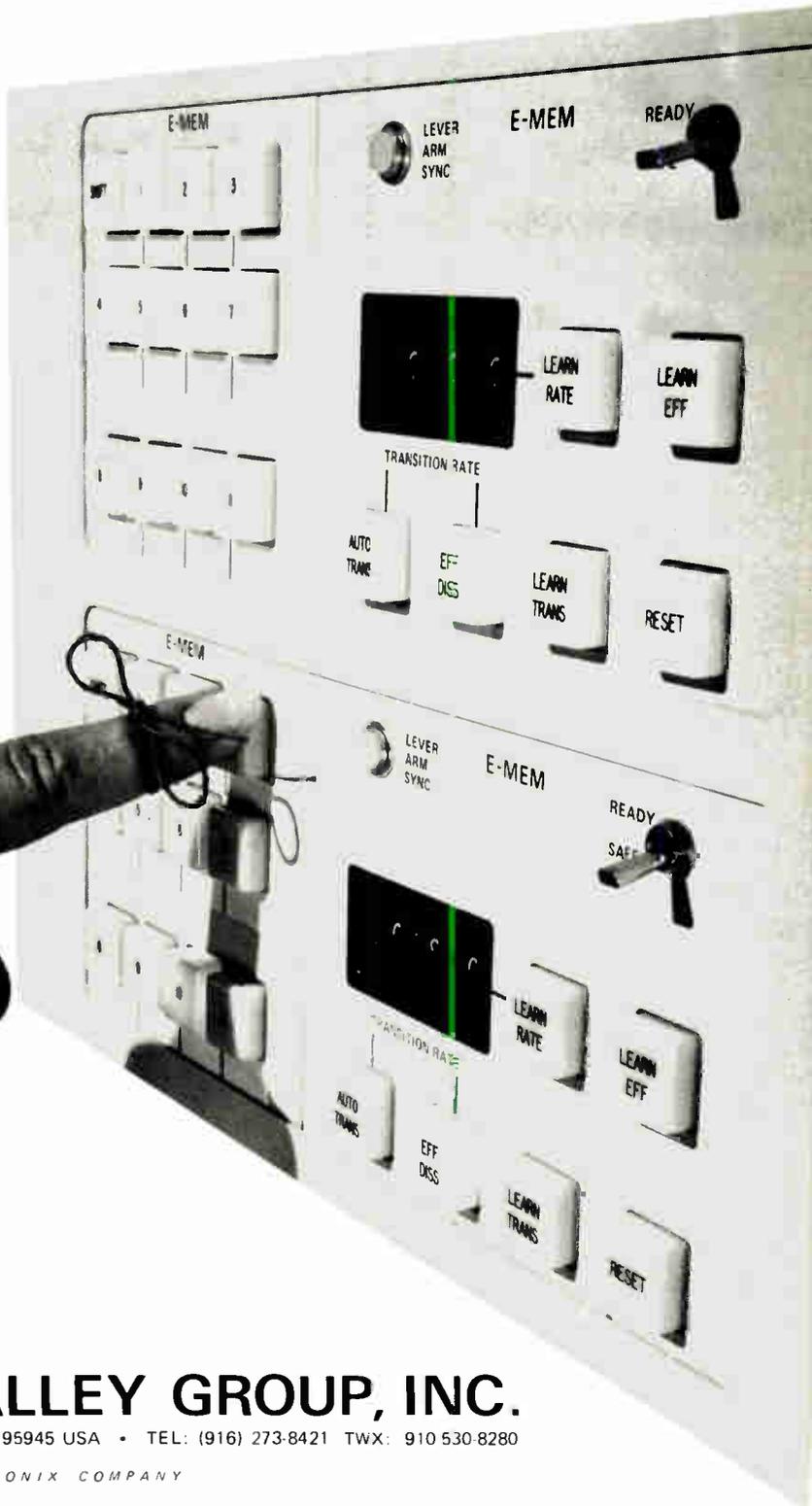
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World Radio History

NAB '79: A worldwide forum

Not too many years ago we were amazed when attendance at the National Association of Broadcasters' annual convention hit the 12,000 mark. Last year we were astounded when the total climbed to 22,000. We once were able to house the majority of delegates in a few major hotels and, for the most part, the sessions, exhibits and hospitality suites were concentrated in a single hotel. We used to expect delegates from outside the United States, but the 1978 meeting attracted over 300 foreign delegates from 39 countries.

What these changes tell us is that our industry has grown so quickly over the past few years, formats are becoming so diversified, and the technology has become so sophisticated that managers and engineers more than ever need a forum where they can exchange ideas with people from all over the world.

The upcoming convention, broadcast engineering conference, and international exposition of broadcast equipment March 25-28 at the Dallas, Texas, convention center will offer such a forum. It promises to be a great meeting and we hope to see an even greater number of representatives from around the world discussing their problems and solutions with their American counterparts.

All sessions and exhibits will be at the convention center. In addition, to make it easier to visit the hospitality suites catering to your particular field, the Hyatt Regency and Dallas Hilton have been designated as radio hotels, the Lowes Anatole and Marriott as television hotels, and the Fairmont as the joint radio-TV hotel.

The international exhibition of broadcast equipment — always the world's largest — will surpass the almost 300 displays over 122,000 square feet that set last year's record. Under one roof you will be able to see demonstrated the most advanced equipment ever available to broadcasters.

And the general assemblies, separate radio, television and engineering sessions, and workshops will provide a wealth of information and opportunities to ask questions. Experts from broadcasting and government will tell it like it is and take a look into the future to give you ideas of the exciting prospects in programming and global communications.

By Vincent T. Wasilewski, *President*
National Association of Broadcasters



Everybody who is anybody in broadcasting will be there: U.S. Senators and Congressmen who serve on committees crucial to broadcasters; commissioners and staff from the Federal Communications Commission; officials from the Federal Trade Commission and the National Telecommunications and Information Administration; all the radio and television networks; representatives, attorneys, and consultants; experts from the National Association of Television Program Executives, Broadcast Financial Management Association, Broadcast Education Association, Radio Advertising Bureau, Television Bureau of Advertising, Television Information Office, Radio and Television News Directors Association, American Women in Radio and Television, and Broadcast Promotion Association.

There also will be more than two dozen workshops covering programming, sales, production, ratings, promotion, cable TV, AM stereo, TV blanking, and UHF. There will be guidance on how to live with government rules and regulations and help on legal problems and equal employment opportunity matters.

Top panelists will get down to the real fundamentals of station operations.

In addition there will be some lively and informative discussions on hiring employees; designing and building a studio; selling, programming, and engineering an automated station; research and how to use it; improving a station's image and audience through community involvement; the making of a jingle from concept through production; and sports in broadcasting.

There will be special Monday and Tuesday morning sessions for spouses. Educational meetings as well as fun sessions will be held so that spouses may participate in broadcast-related meetings.

And there will be presentations of the Distinguished Service Award at the opening general assembly and the Engineering Award at Tuesday's engineering luncheon.

At the separate and concurrent engineering conference you will learn how your fellow engineers (general managers are invited as well) are using new equipment and how to repair and maintain it. Find out what is just down the road in the latest technology as well as how to plan for it and deal with it.

Sessions will cover such topics as one-inch videotape; closed captioning and other television ancillary signals; a review of the set-up, adjustment, and measurement of audio processing equipment; principles of communications satellite systems; the absence of radiation hazards in broadcasting; the state of the art in audio tape and magnetics; adapting AM transmitters for stereo transmission; an update on digital editing and special effects for TV; and a description of the engineering preparations for the 1980 Olympics.

At the conclusion of Monday's session there will be a reception for amateur radio operators.

Wednesday's closing luncheon will feature top entertainers performing exclusively for NAB convention-goers.

It's going to be a top-notch convention and one you won't want to miss. So join your fellow broadcasters and meet with us in Dallas March 25 for an exciting four days of activity.

Vincent T. Wasilewski

ON
LINE
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ITALY

Controlling private stations

The government has proposed a new bill designed to regulate private stations, but some ask, "Is it necessary?"

The Senate is presently considering a new bill on Italian broadcasting designed to bring under control the thousands of private stations which have appeared since 1974.

In 1974 the Constitutional Court ruled that the government did not have a state monopoly of local cable television systems. After months of debate, Parliament passed a new law in 1975 legalising private cable systems.

In another court decision in 1976, however, certain sections of the 1975 law were ruled unconstitutional. In essence, the court said the state monopoly was constitutionally legitimate on a national scale, but the constitution upholds the individual's right to launch private ventures — including broadcast stations.

According to Antonio Gullotti, Minister of Posts and Telecommunications, the new bill is merely an amendment to the 1975 law, providing for regulation of private radio and television stations. The bill is designed to provide the best use of the limited number of airwaves available to broadcasters.

"The [government] policy has two aims," Gullotti said. "The first is that the electromagnetic spectrum, which in the past has been subjected to some degree of waste, should be used rationally and efficiently. The second is that the right balance should be found between, on the one hand, the national, public broadcasting service and, on the other, the freedom of the air as a basic means of expression of the constitutionally upheld rights of citizens, in order to further the social and cultural development of the civil community."

A government agency, called Comitato Nazionale per la Radiodiffusione (CNR), would be established to implement this policy. It would allocate frequencies, grant licenses, and regulate the airwaves.

A key section of the new bill calls for the restriction of service areas for broadcast stations. This is considered a critical need in Italy, which since the 1974 court ruling has passed the U. S. in terms of the number of stations per person. There are 25,825 radio stations for each person in the U. S.; Italy has one station for every 24,747 persons. There is one television station for every 216,260 persons in the U. S.; but in Italy, it is one for every 111,930. According to figures compiled



last year, Italy has 2,275 radio stations and 506 television stations.

Radiotelevisione Italiana (RAI), the national broadcasting service, has given its support to the bill, although it was expected to favour additional control of the private sector. Until 1975, RAI held the monopoly on Italian broadcasting. The new bill, if passed, would improve RAI's present position in relation to private stations.

RAI wants to create a third TV channel which would be operated by its autonomous regions throughout the country. In addition, each of RAI's 21 regional stations would occupy approximately one-fourth of the regional frequencies, and broadcast about 2½ hours each day. These two proposals are considered by RAI as essential if the government system is to compete with the growing power of the private stations.

Giuseppi Richeri, communications researcher at the University of Bologna, believes this intensifying confrontation between the government and private interests will hurt Italian broadcasting, actually lessening personal freedom guarantees and the pluralism of information.

Speaking before the ICC Annual Conference, held recently in Dubrovnik, Richeri said, "If the twin threats of concentration and commercialisation are resisted, on the other hand, the local stations could make a valuable contribution to the democratic reform of the Ita-

lian system. It is not a question, I think, of defending at all costs a public monopoly against the development of private local broadcasting stations. There are plenty of instances of state television systems which have just as sizeable negative effects on freedom, democracy, and participation as do commercial, oligarchically-controlled television systems (or even more than they do)."

Richeri favours complete reform of the public television service. He also sees the private stations as having an important supplementary role to the public service by providing local communities with a means of information and expression.

He sees the public and private stations as part of the "whole" system. But current debate indicates that this approach may be too idealistic. Recent public opinion surveys show the bill is not gaining wide support, and the confrontation between government supporters and private interests is heating up.

Despite the debate, it is hard to argue that private stations have not had an important contribution to Italian broadcasting. Most importantly, private, locally-operated stations have given smaller communities a voice in their affairs. Also, as Richeri and others have continued to point out, the rise of private stations has improved the quality of programmes and the number of radio and TV sets sold in the country.

The sale of FM radios has increased dramatically since 1975, when the court ruled against the state monopoly of broadcasting. There has also been a sharp rise in the number of colour television sets in recent years — at least partially the result of the growing number of foreign colour television programmes available to Italian audiences.

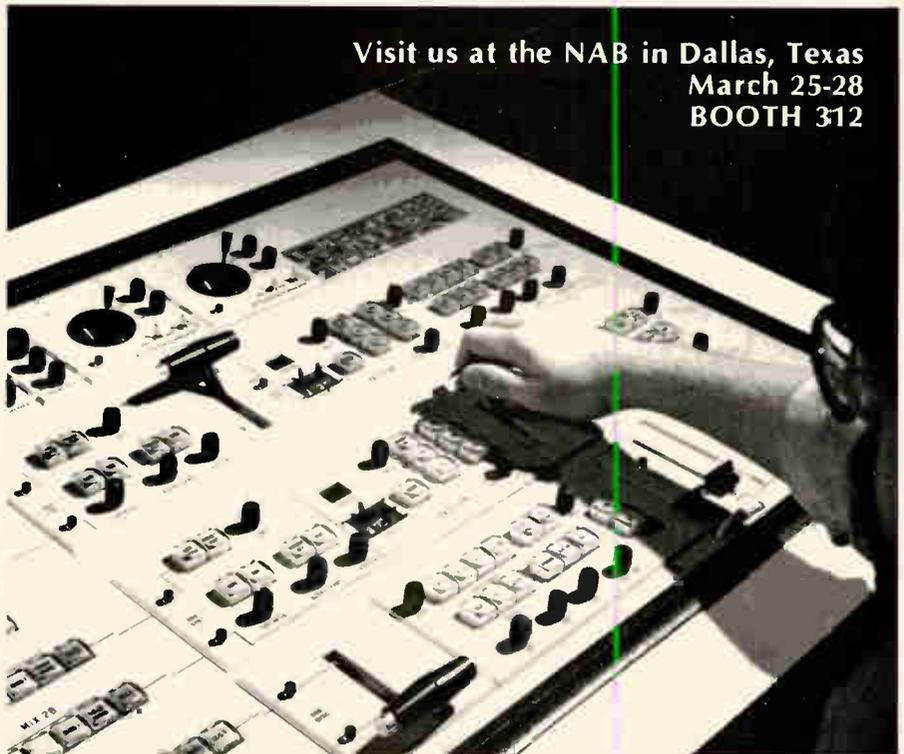
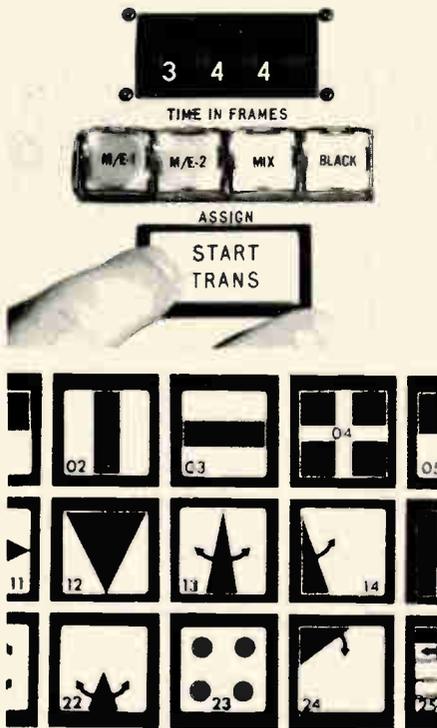
These aspects of private broadcasting are being stressed by private interests who oppose the new bill. They say that private stations must be allowed to become well established and financially secure before being subjected to strict government restrictions. These arguments are now being heard by special commissions created by the Senate. But the outcome of this new bill may still be months away.

Continued on page 10

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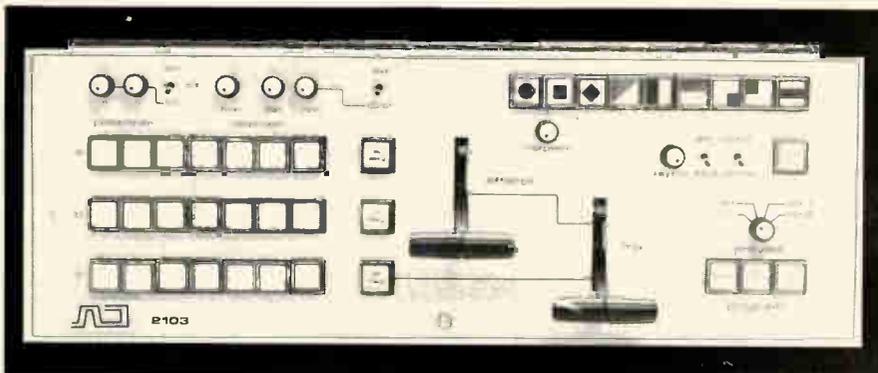


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UNITED STATES

Trend away from cross-ownership

The number of newspaper-television combinations is continuing to drop, according to the NAB's John Dimling.

Since 1970 the trend in the U.S. has been away from local newspaper-broad-

casting cross-ownership, according to John Dimling, vice president and director of research, National Association of Broadcasters.

Dimling, who recently participated in a panel discussion during the Federal Trade Commission Symposium on Media Concentration, pointed out that today there are only 37 newspaper-television combinations, or just 5% of the television stations in the United States.

Since his involvement in the subject of

cross-ownership began in 1970, Dimling said, "perhaps one of the most important things to be said about local cross-ownership is that it has become less interesting." He pointed out that in 1970 there were 94 newspaper-TV combinations representing 14% of the television stations in the country. That number dropped to 43 in 1978; but since six are subject to divestiture under FCC rules, Dimling said the actual number is 37.

Dimling predicted that this number will continue to drop because the FCC rules ban the acquisition of stations by organizations that own newspapers collocated with the station.

However, Dimling noted, many people have a tendency to overlook additional sources of information that do not originate in a market. For example, he pointed out that Washington, D.C., supports the *Star* and *Post*, but both the *Wall Street Journal* and the *New York Times* have substantial readership.

"What's more," he said, "we often overlook the availability of television signals from other markets. Although a typical television market may have only three local stations, 98.5% of television households in the country can receive more than three signals, and over half the households can receive seven or more signals."

SWITZERLAND

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The first overseas digital facsimile service begins between the U.S. and Switzerland.

Switzerland has become the first country in Europe to offer commercial digital facsimile service to the United States. The service, called Q-Fax, was introduced by RCA Global Communications Inc. and Radio Suisse Ltd.

Q-Fax was first set up between RCA Globcom in New York and KDD in Tokyo on March 1, 1978. And its ability to transmit non-Roman script and quick service made it an immediate success. Since that time, Q-Fax has been introduced in Hong Kong and Manila; other overseas points will be added in the near future.

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Continued on page 12

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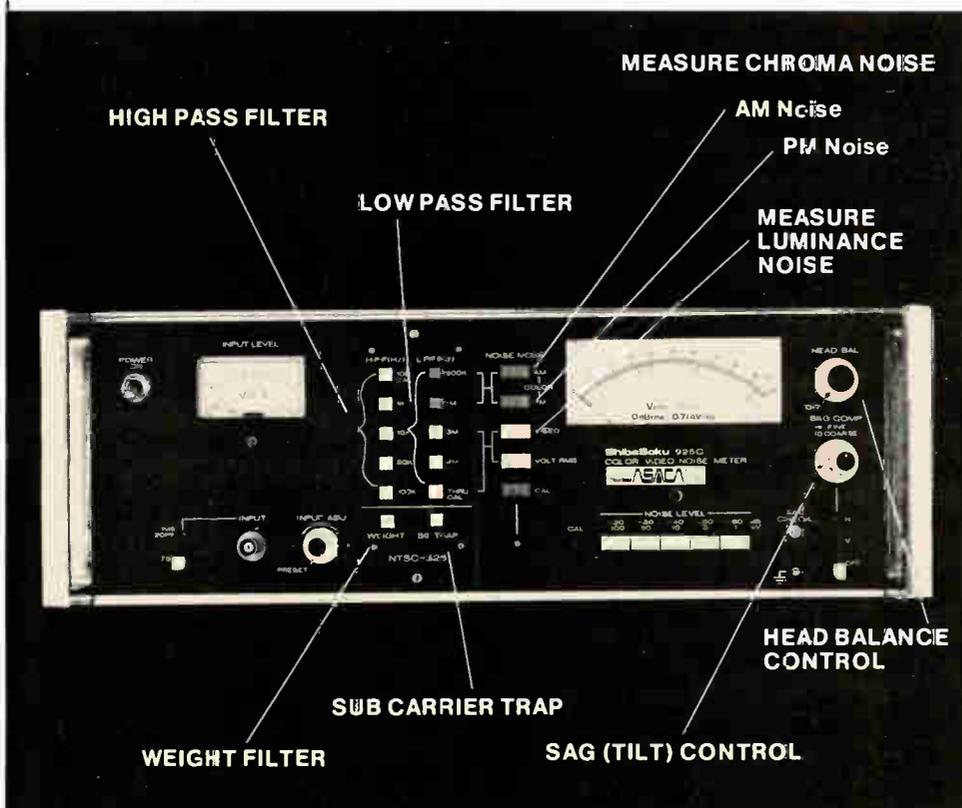
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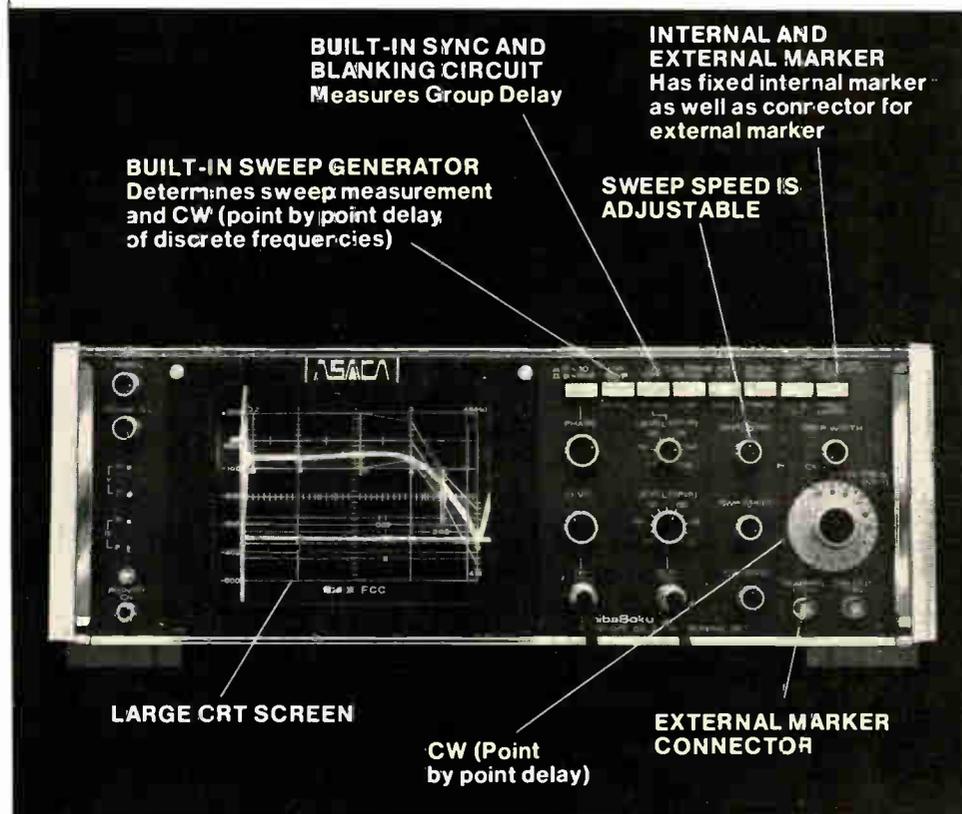
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Introducing the new ESP-1 programmer system from SMC, the innovators in broadcast audio control.

The ESP offers a modern microprocessor controller with a deep 4,000 event memory, including sub-routines and fully programmable clock. The only simple thing about ESP is the ease of service and the lack of knobs, buttons and complex video terminals.

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WORLD UPDATE

the Far East is \$10.

The use of Q-Fax is continuing to grow each successive month, with customers now using the service to transmit a variety of material including legal forms, patent applications, shipping manifests, computer printouts, and drawings.

UNITED STATES

New "Order of the Iron Test Pattern"

Dynair Electronics initiates award programme to honour those in TV industry.

Other than a few singular association awards, recognition for contributions to the television industry are quite rare. Starting immediately, Dynair Elec-

tronics has designed a programme to rectify this situation.

Dynair has designed the Order of the Iron Test Pattern certificate and medallion for those who have made technical contributions to the television industry, with at least 15 years in the business as a minimum requirement. While the certificate title has a tongue-in-cheek ring to it, Dynair is intent upon paying tribute to those who contribute over the long haul.

The parchment certificate and ribboned medallion do make an attractive office display.

According to Dynair, the certificate is not limited to engineers. What's more, they will accept applications from those interested outside the United States. Applications for the certificate are available through Phyllis Lynch, Dynair Electronics Inc., 5275 Market Street.

Continued on page 14

UNITED STATES

FCC Report: Look for satellite earth station relief

Hottest on the list of Commission activities is their inquiry to examine the possibility of deregulation of domestic earth stations. This should bring a standing ovation. Specifically, the FCC inquiry would look into costs and benefits of the domestic satellite receive-only earth station regulatory programme to determine whether the present programme can be improved or eliminated in light of the technical and policy changes that have been and will be occurring in satellite communications. Comment and reply dates will be announced later (Docket No. 78-374; FCC 78-829).

Of course AM stereo is still on the front burner. And Docket No. 21313, FCC 78-638 should draw considerable reaction on the proposal for standards to consider the effect of an AM stereo signal on adjacent channel protection ratios, skywave service, out-of-band emissions, directional antenna operation, and compatibility of AM stereo signals with existing monophonic receivers. Meanwhile, Harris has introduced a second system for consideration.

A further rulemaking notice by the Commission would limit the coverage range of the existing 25 Class 1-A clear-channel stations to make room for additional AM stations. Comments are due April 9, and replies by May 9. Refer to Docket No. 20642, FCC 78-63.

Cutting a little into its red tape, the Commission has combined forms 701 and 321 into a new form 701. These forms covered the application for additional time to construct a radio station, and application construction permit to replace expired permit. The rule change to reflect this change in paperwork will become effective March 23.

And applicants for domestic satellite earth stations will no longer need to submit those lengthy computer listings to provide the full details of their analysis of precipitation scatter interference due to intersections of terrestrial antenna beams and the antenna beam of the proposed earth station.

Recognising the equipment delivery delays of earth station hardware and a large volume of requests for an additional three months for construction completion, effective immediately, simultaneous construction permits and licenses issued for domestic satellite earth stations will allow a period of 180 days from the date of the grant for completion of construction.

"a professional studio recorder with a handle"

"ReVox new B77 is long on performance and short on Mickey Mouse features."

That's what Herb Friedman said about the ReVox B77 in Hi-Fi/Stereo Buyers' Guide.* If you do location recordings, you'll be interested in what Herb has to say.

In addition to evaluating products for magazines, Herb Friedman is Chief Engineer for Tridac Electronic Laboratories and a major New York radio station. As such, he produces taped programming and he knows the real differences between truly professional recorders and others that claim to have "professional features".

Differences like 18dB record headroom, flat response with no low frequency "head bumps", the highest usable dynamic range and the lowest noise of any portable recorder. Add to these such features as all-digital-logic-control of tape motion, large meters with LED peak level indication, self-contained tape splicer, and rugged 37-pound package with a handle and you've got the best location recorder in the world.

If you'd like to know what else Herb Friedman thinks about the B77, please circle reader service number or write to us for complete information including a reprint of his article and a list of professional audio dealers where you may see and hear the ReVox B77 demonstrated.

REVOX

Studer ReVox America, Inc., 1819 Broadway, Nashville, Tennessee 37203 (615) 329-9576
In Canada: Studer ReVox Canada, Ltd.

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World Radio History

Circle (11) on Reader Service Card



San Diego, CA 92114. Ms. Lynch can be reached at 714-263-7711. Applications also will be available at the Dynair booth during the upcoming NAB convention in Dallas.

THE NETHERLANDS

New broadcast rules proposed

A new bill increases membership requirements for associations broadcasting radio or television programmes.

The minimum number of members needed before an association can be allocated transmission lines will be raised substantially, if a new bill recently introduced is passed.

Under current regulations, any group with a minimum number of members is allowed to transmit television and/or radio programmes. For example, 100,000 members are needed to transmit programmes for Category C; however, under the proposed bill, 150,000 members will be needed. For Category

B, 250,000 members are needed at the present time, but this would increase to 350,000. Associations transmitting in Category A would need 500,000 members rather than the current 400,000.

The increase in membership requirements is considered essential because of a separate bill also introduced recently. This bill would allow children and others to join their own associations, making it easier for associations to add members. Presently, children cannot join a station that their parents don't belong to because they would not have paid the family's license fee for that station.

UNITED STATES

NTIA wants more AM stations

A petition filed with the FCC asks for a reduction in AM spacing.

The National Telecommunications and Information Administration (NTIA) has asked the Federal Communications Commission (FCC) to open a rulemaking procedure on reducing the required

spacing between AM radio channels, thus allowing for 12 to 14 additional channels in the current AM frequency band (540-1600 kHz). The NTIA wants the required spacing reduced from the present 10 kHz to 9 kHz.

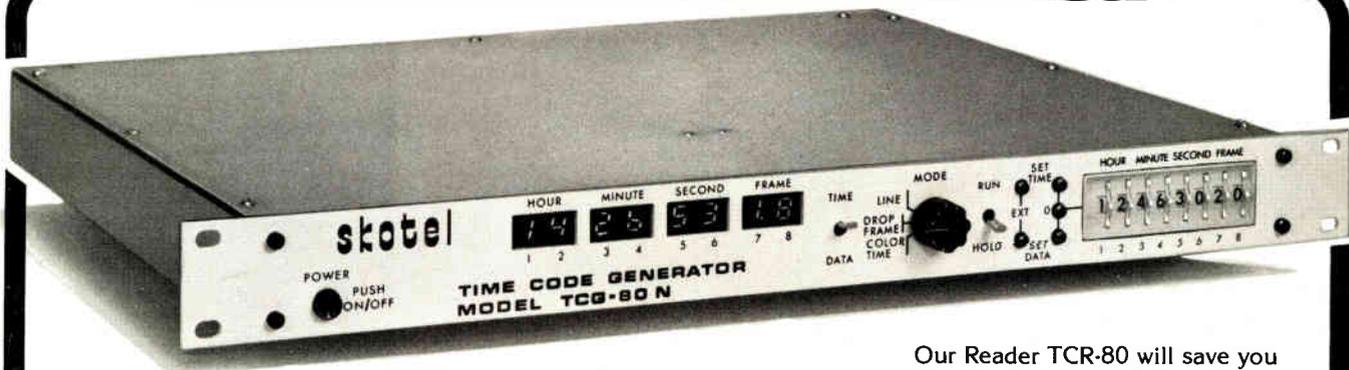
In its petition, NTIA said that it would be appropriate to consider such reductions "so as to provide for a significant increase in the number of broadcast stations, with concomitant opportunities to enhance local ownership by minority and special interest groups, augment program diversity, and alleviate some of the problems of daytime stations."

Other possible benefits resulting from the proposed spacing reductions would include the following:

- A decrease in potential interference to U.S. AM broadcast signals from Western Europe, Africa, and the Pacific area. (These regions have switched to 9 kHz spacing and the difference in the United States' and their channel spacings could cause "heterodyne" interference.)

- A stimulation of global competition — with resultant lower costs to the public — in digitally-tuned receivers due to worldwide compatibility of AM transmission standards. **BC**

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Skotel Time Code Generators and Readers will conveniently and accurately identify audio and video tapes with SMPTE User Data.

The TCG-80N Generator has unique features that meet the growing demand for identifying tapes with start of program sequences, scene/take numbers, official time of sporting events, time countdowns and documentary data.

The User Data memory can be loaded from the thumbwheels or from an external source, and the Data and Time code is displayed on the front panel.

Another feature that can be added to the Generator and Reader is our video character generator. It has an integral insert keyer that can simultaneously insert User Data and Time code into selected positions in the video of a work print or on a monitor.

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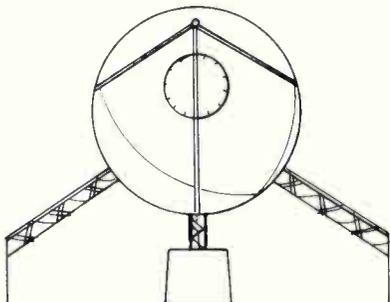
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MEXICO — A 32-meter satellite earth station antenna system is being installed at Tulancingo, 70 miles northeast of Mexico City. The sys-



tem, supplied by E-Systems, will provide twice the communications capacity of the existing Tulancingo earth station. The contract between E-Systems and the Mexican government also includes civil works and installation. The system is scheduled to begin operation in August 1979. It will operate with the Intelsat V satellite.

CANADA — The government has entered an agreement with the European Space Agency (ESA) which will allow Canada to participate in long-term planning of proposed future space projects. As a result of collaboration with ESA in the planning of these projects, Canada expects to develop new cooperative space programmes with Europe. Of particular interest is future cooperation in the field of communications satellites and earth observation satellites. The agreement went into effect last month.

USSR — Radio Moscow has begun a new World Service somewhat similar to the one operated by the BBC. The World Service provides news and comment about the USSR and international affairs. It is broadcast in English each day from 4 a.m. to 11 p.m., although it will soon go to 24 hours.

VENEZUELA — Videomovil, a major television commercial and programme production facility in Caracas, is expanding its capabilities with the purchase of telecine systems and live colour TV cameras from RCA.

The equipment order includes a complete TK-28 film originating system, including telecine camera, multiplexer, film projector, and slide projector. Also included are two TK-760 colour cameras. Videomovil specialises in the production of commercials, mini-programmes, and musical shows for airing throughout Venezuela.

LUXEMBOURG — Data processing and technology will be the major topic at the Fourth European Congress on Information Systems and Networks, scheduled for May 15-18, 1979. The Congress is being held in the offices of the Commission of the European Communities, organisers of the event. For more information, contact Director General, Scientific and Technical Information, and Information Management, DG 13, FEC, Batiment Jean Monnet, Rue Alcide de Gasperi, Luxembourg.

CANADA — A coaxial CATV trunk system approximately 145 miles long has been placed in service between Winnipeg, Manitoba's capital city, and four rural communities. The new system will deliver television and FM broadcast signals to CATV companies in the rural communities; however, future services will include the transmission of high-speed data, teleconferencing, medical and educational television, and telephony. The cable system utilises low-distortion amplifiers, developed in Canada, to provide high-quality bi-directional CATV signal transmission of up to eight channels in the forward direction and four in the reverse.

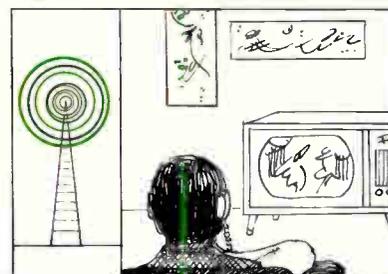
UNITED STATES — A special rally is being held February 28 in Washington, D.C., to petition Congress and the Federal Communications Commission (FCC) to expedite the elimination of needless federal regulation of the broadcast industry. The National Association of Broadcasters (NAB), backers of the rally, want the government to eliminate FCC-imposed limits on commercial time, ascertainment requirements, and programming guidelines. Other rally supporters include the National

Radio Broadcasters Association, National Religious Broadcasters, and Daytime Broadcasters Association.

ICELAND — Now under consideration is a joint-Nordic television relay system which would link all the countries associated with the Nordic Council: Denmark, Norway, Sweden, Finland, the Faroe Islands, and Iceland. The proposed system, called NORDSAT, would beam TV signals between countries participating in the project. Although still years away from final implementation, a NORDSAT television relay would allow users to select any signal being sent by the satellite, thus minimising government control of programmes.

TUNISIA — The growing importance of communications satellites worldwide was again in evidence at the United Nations, where Tunisia introduced a resolution calling for an improved system of information dissemination (via satellite) which would result in a better, more stable world information and communication order. A resolution asking for increased assistance to developing countries in the field of communications technology was also introduced recently by Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

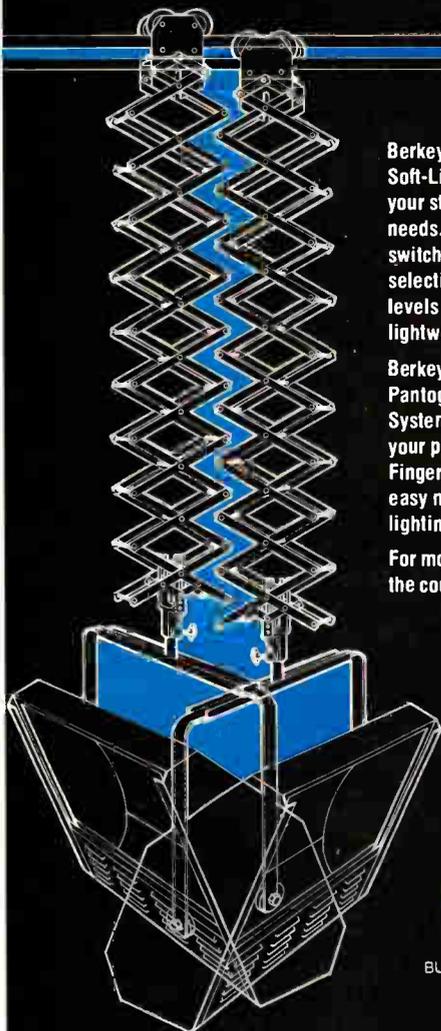
JAPAN — The Ministry of Posts and Telecommunications has approved the use of multiplex sound broadcasting by Japanese television stations.



TV stations may use the new system, which allows two sound signals to accompany each picture, for either stereo sound or two soundtracks for foreign films (a Japanese track plus the original). Nearly 30 stations have already applied for permission to use the new system.

GLOBALVIEW

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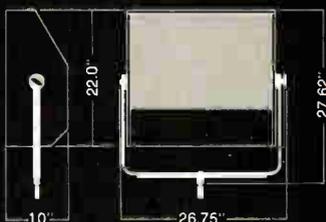


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Mr. Irfanullah of the Pakistan Broadcasting Corporation is the new chairman of the ABU Standing Engineering Committee. Irfanullah, PBC's director of engineering, was elected to a two-year term at the 15th ABU General Assembly held recently in New Delhi. In addition to taking an active part in ABU engineering meetings, Irfanullah has made several contributions to the *ABU Technical Review*. He succeeds Ahmad Fadami of the National Iranian Radio and Television who was chairman for 1977-78.

Mortimer Goldberg, who has been with CBS since 1951, was recently appointed manager, technical services, of the CBS Radio Network. Goldberg has served in both managerial and operational capacities, and was named engineer-in-charge in March 1978. A member of the Audio Engineering Society, he has written extensively for technical journals.

The development and production of young people's programming in the U.S. will be the main responsibility of Faith Frenz Heckman, recently named director of children's programmes at CBS Entertainment. Heckman had been director, children's programmes, Hollywood, since October 1977, and had a similar post with the CBS Television Network since July 1975. Prior to that, she had been associate director and general programme executive, children's programmes, since 1969.

Michael Thomsen, assistant director of instructional services for the University of Arizona Radio-TV-Film Bureau, has been invited to teach a special workshop in Bogota, Colombia. The workshop is part of an educational television seminar being held at Colegio CAFAM (Caja de Compensacion Familiar). The purpose of the seminar is to provide information on educational television, including programming, production, and technique. Thomsen was selected largely because of his experience in instructional television and his familiarity with Colombia.

Bruno Hochstrasser has been named president of Studer ReVox America Inc., it has been announced by Willi Studer. Hochstrasser will be responsible for all USA activities of both the Studer line of professional tape recorders and associated equipment, and the ReVox brand of audiophile components. He previously served as vice president of Studer ReVox of Canada Limited for four years until his return to the home office in 1977.

Richard Wyckoff, assistant general counsel of the National Association of Broadcasters, has been promoted legislative counsel in the NAB's Government Relations Department. Wyckoff joined the NAB as an attorney in 1974, and was named assistant general counsel in August 1977. He previously was an attorney with the Federal Communications Commission, and will utilise his background with the FCC in his new position.

As vice president, television operations, for Time-Life Television, Wynn Nathan will be responsible for investigating and developing new marketing areas for Time-Life. Nathan, who has experience in the distribution of BBC programming, will also assist in the evaluation of upcoming BBC programmes for both public and commercial television. Nathan

Continued on page 18

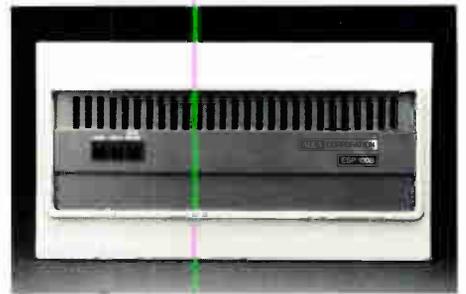
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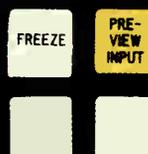
STILL STORE



CHANNEL - A
ON AIR

1098

FREEZE



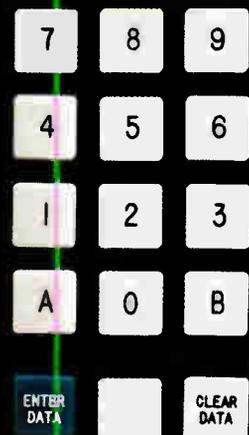
STATUS



CHANNEL - B
ON AIR

14083

DATA ENTRY



joined Time Incorporated in 1970; prior to his recent appointment, he was vice president, worldwide syndication, for Time-Life.

Denise Nevinger has been named circulation manager of *Broadcast Communications*, it was announced by Mike Kreiter, president/publisher. Ms. Nevinger was formerly assistant to the president of a major commercial funding company, where her duties included the compilation and maintenance of financial documents and client lists. **BC**

Moving Up

RONALD FRIED, formerly president of International Video Corporation, has been named vice president/general manager of Toshiba's new Broadcast Electronic Systems Division. The division, located in Sunnyvale, California, is a branch of Toshiba International Corporation, the company's U.S. industrial marketing arm. The appointment of Fried to head this new division signals the entrance of Toshiba Corp. into the U.S. and Canadian broadcast equipment market.

ROGER PRYOR has been named general manager of Sony's newly established Digital Audio Products Division. Pryor, who joined Sony in 1976, had been manager of the Video Products special project development section.

FRANK SANTUCCI is the new international sales manager at Scully Recording Instruments. Santucci assumes worldwide responsibility for sales of Scully professional audio recorders and Dictaphone voice communications recording systems.

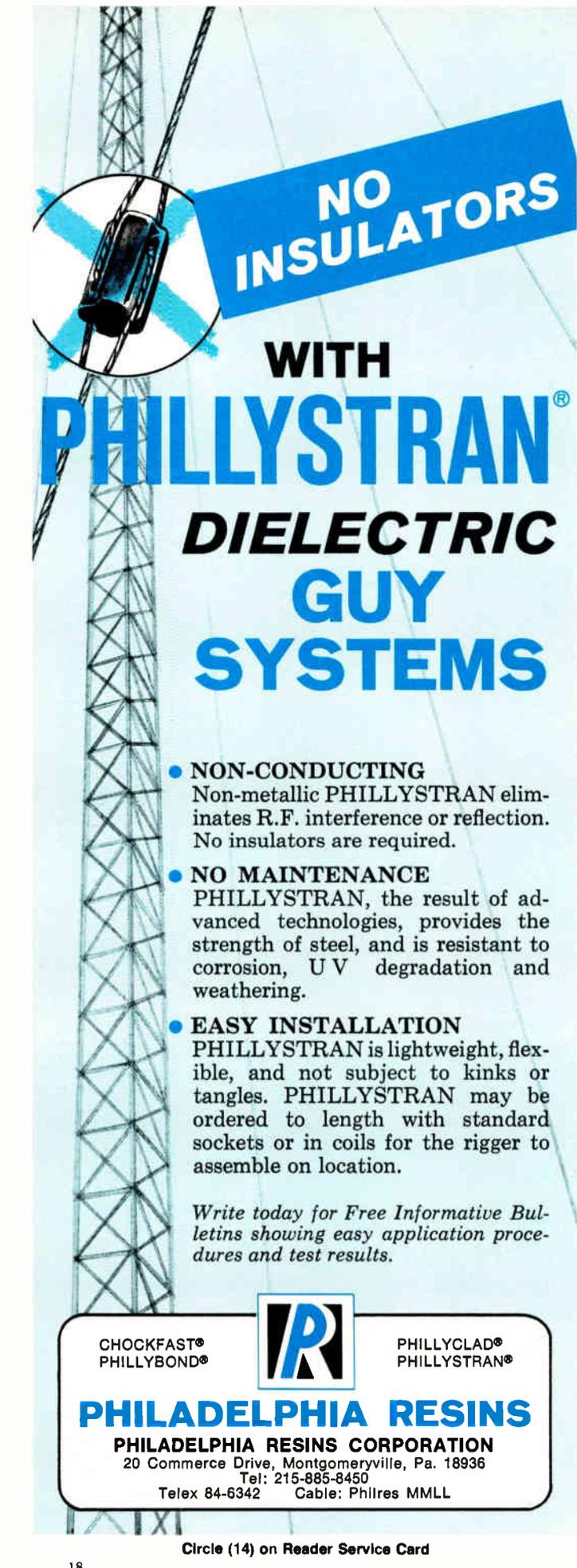
DAVID A. DEVER, recently named eastern district manager for Micro Consultants Inc. (MCI/Quantel), is setting up new district offices in Stamford, Connecticut. The new district office is at 300 Broad Street, Stamford, CN 06901; (203) 348-4104.

MICHAEL MONK has been appointed marketing manager for Hitachi. Monk, who was regional manager in Atlanta, will work from the company's national headquarters in Woodside, New York.

OSCAR KRAUT, new sales manager of black and white closed-circuit CCTV products for Ikegami Electronics, will be responsible for directing the sales force of independent sales representatives. He will also be responsible for the policies relating to the company's dealer network.

ARIE LANDRUM, JR., joined Lenco's Electronics Division as southeastern regional sales manager. He will be headquartered in Decatur, Georgia, and will be responsible for sales in Alabama, Florida, Georgia, Tennessee, South Carolina, and North Carolina.

FRANK RICH is the new director of marketing at Time and Frequency Technology. In this new position, Rich will handle the marketing of the company's line of digital remote control systems, monitors, emergency broadcast systems, and STL links.



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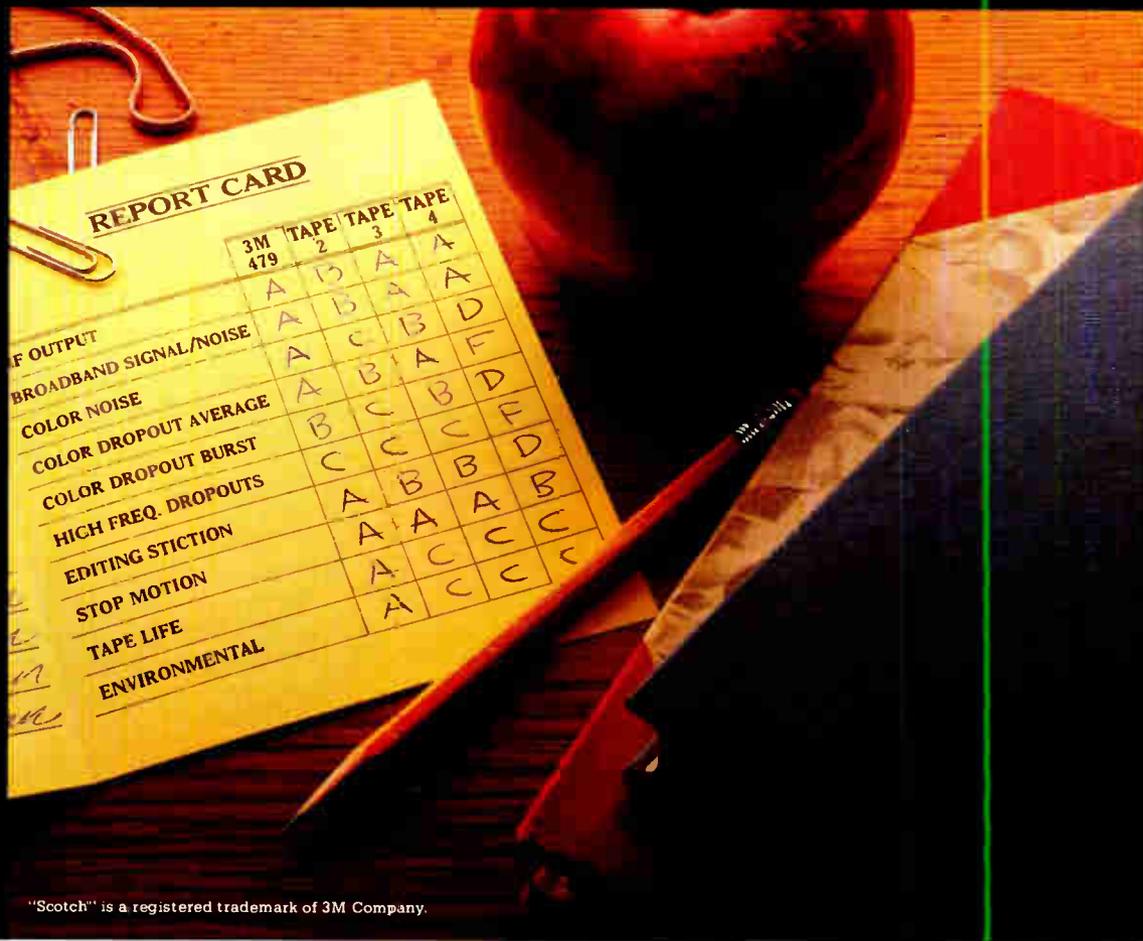
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ABU/India

Update on new technologies

More than 70 technical papers were presented at the annual meeting of the ABU Standing Engineering Committee.

Twenty-eight organisations were represented at the recent meeting of the ABU Standing Engineering Committee hosted by All India Radio (AIR) and Doordarshan (DDI) in New Delhi, India. During the three-day event, 75 technical papers were submitted by the various ABU Working Parties.

Working Party 1 is presently working in a variety of areas, including sea gain in MF propagation, effects of polarisation coupling loss, and effects of ionospheric cross modulation.

Working Party 5A reported that it had completed sections of the Standards Manual dealing with film and videotape facilities in member organisations; this work is intended to promote the exchange of programmes between ABU members.

Several papers, most dealing with television studio techniques, were submitted by Working Party 5B. Updates were heard on cameras and camera tubes; signal assignment systems; VITS; low-cost TV studios; digital technology; microprocessor systems; OB vans; lighting equipment; and TV training facilities.

Working Party 5C, concerned with TV transmitter techniques, said it had prepared a draft manual on performance measurements of monochrome television transmitters. It also reported that the goal this year is to include data on colour television transmitter performances.

Satellite broadcasting has been under study by Working Parties 6 and 6A. Working Party 6 summarised the plans and experiments on satellite broadcasting in member organisations.

Other topics covered by the technical papers included propagation and noise in the LF band; wide-screen television; computer-generated TV graphics; AM monitors for transmitters; and lighting equipment.

At the meeting, six Working Parties were reorganised to conduct study in several areas: satellite broadcasting; propagation, transmission, and spectrum utilisation; production equipment and techniques; programme recording and exchange; and new technology.

The engineering committee also formed a group of senior training

specialists representing each ABU member organisation. This group will meet several times during the year to exchange ideas, prepare training documents, and to promote cooperation between ABU members.

CAB/Canada

Broadcasters fear decentralisation

The CAB says more time is needed before major changes in national broadcasting regulations can be made.

Feared possible decentralisation of control over Canada's national broadcasting system, the Canadian Association of Broadcasters (CAB) has submitted a brief to the Clyne Committee calling attention to the seriousness of the issue. The committee was established by Communications Minister Jeanne Sauvé to study the state of Canadian communications.

In the brief, the CAB says the paramount national issue was omitted from the committee's terms of reference. That issue involves the extent to which control over the existing system of Canadian communications should be negotiated as part of a constitutional rearrangement of powers.

The CAB asked the committee, "Why should there not be a call for a clear statement of provincial broadcast or telecommunications objectives and the effect on Canadian unity before there is any further action by politicians to enter into bargaining sessions?"

Recommendations on jurisdictional and constitutional matters have not been requested of the Clyne Committee. Instead Madame Sauvé has asked the committee to make a study and complete a report by the end of February on "the implications of telecommunications for Canadian sovereignty."

The committee's reporting deadline is February 28 — just before a planned federal-provincial meeting in March of communications ministers.

"The committee exists with a serious omission in its terms of reference. Not that it makes much difference at this date," said G.G.E. Steele, CAB president. "A constitutional rearrangement of powers over communications requires a much deeper and longer debate than can possibly take place over the next 60 or 90 days."

The Clyne Committee was asked to study and make recommendations in five areas: use of satellites, foreign pro-

gramming, the status of cable companies, timing for pay television, and balance of payments in electronic products.

The CAB brief comments on all five areas, but points out "if it is not possible for the committee, simply because of time constraints, to meet with many other groups and with the public, then we submit that a central part of your recommendation to the Minister should be to urge her, and through her the government, to open up the subject for wide public debate and discussion."

The brief stresses that the Telesat Canada board representation should not be restricted merely to the government and common carriers and chided Bell Canada top management for contending that "competition and regulation make strange and incompatible bedfellows."

NATPE/United States

Programming: What's ahead for TV

U.S. programme executives to meet in Las Vegas at annual conference.

The impact of superstations and the problems of a fourth major network are just two topics to be covered at the National Association of Television Program Executives (NATPE) annual conference, scheduled for March 9-14 at the MGM Grand in Las Vegas.

The hospitality suites will open Friday, March 9. But the conference will get underway at a continental breakfast Saturday morning. Attendees will hear a report on the past, present, and future of NATPE. Speakers will include Jim Majors, immediate past president; A.R. Van Cantfort, president; and Chuck Gingold, first vice president.

The IRIS Awards banquet will be held Saturday evening, with Richard Dawson serving as master of ceremonies. Donny and Marie Osmond are the featured guest performers.

Meetings for affiliates and independents will be conducted Sunday, March 11. Irwin Starr, WJLA-TV, Washington, will moderate the ABC meeting. Moderator for CBS will be Tom Kenney, KHOU-TV, Houston. NBC moderator is Marv Chauvin, WOTV, Grand Rapids. Moderator for the PBS meeting will be C. Paul Corbin, KOCE-TV, Huntington Beach. Greg Nathanson, KTLA, Los Angeles, will moderate the meeting of

Continued on page 22

Meet an editor who gets the most out of our new 1" equipment.

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And that's the Sony Broadcast BVE-500A.

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SONY BROADCAST

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Simultaneous workshops featuring producer-hosts of talk shows will be held Monday, March 12. This will follow a discussion entitled "Children and Television."

Sessions scheduled for Tuesday include "Programming and Promotion: Hand in Hand or Foot in Mouth?" and "The Critics Are Revolting." There will also be special workshops: "From ENG to ELP . . . The Minicam Comes to Local Programming"; "The Fourth Network — A New 'Bastard' in Prime Time"; "How To Manage — By Guts or By Guile"; "Invasion of the Hut Snatchers"; and "New Frontiers in Worldwide Television."

The conference will conclude Wednesday, March 14, with two sessions. Jim Major, KGO-TV, San Francisco, will moderate "The Superstations: Implications and Complications." Panelists include Russ Barry, 20th Century-Fox; Norman Horowitz, Columbia Pictures Television; Norman Walt, McGraw-Hill Broadcasting; and Vincent Wasilewski, National Association of Broadcasters.

"The Development Jungle — The

Next Five Years" will be moderated by Chuck Gingold, KATU, Portland. Panelists include Ave Butensky, Viacom; Sandy Frank, Sandy Frank Productions; Wes Harris, NBC-owned stations; Seymour Horowitz, ABC-owned stations; E. Hal Hough, CBS-owned stations. FCC commissioner Joseph Fogarty will be a discussant.

For more information on the NATPE conference, contact NATPE, 30 East 42nd Street, Suite 1205, New York, NY; (212) 687-3484.

NRBA/United States

FTC proposals violate rights

Government proposals calling for more stringent PSA requirements are a "radical intrusion" into broadcasters' rights.

The National Radio Broadcasters Association (NRBA) has gone on record as opposing recent proposals by the Federal Trade Commission (FTC) to place

stringent public service announcement (PSA) requirements on broadcasters.

The FTC proposals filed with the FCC would require licensees to air a minimum of PSAs each day, and would regulate the scheduling and content of the PSAs.

According to Abe Voron, NRBA executive vice president of government affairs, the FTC proposals, if adopted, would go far beyond any regulation which the FCC has ever adopted in the past. In addition, Voron said, the FTC comments to the FCC "don't contain one iota of factual information that would support the actual existence of the ills which the rules would supposedly cure."

The NRBA feels these proposals would only serve to increase the regulatory burden already imposed upon licensees. The association continues to believe that the number of radio facilities in the U.S. provide adequate competitive forces to allow the marketplace to regulate radio. "Yet another regulation by a government agency to impose a Washington regulator's conception of what should be in the public interest is simply not needed," Voron said. **BC**



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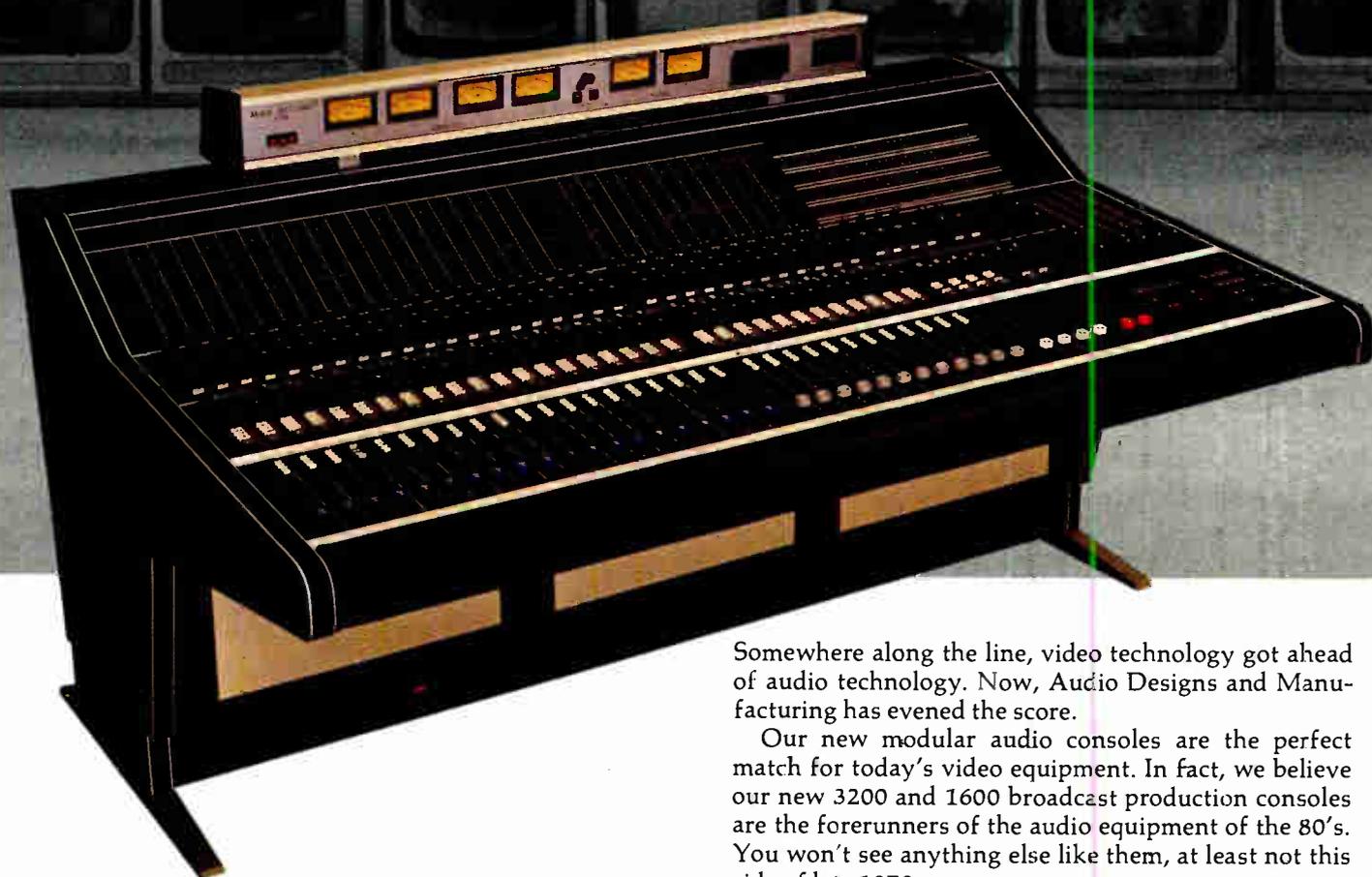
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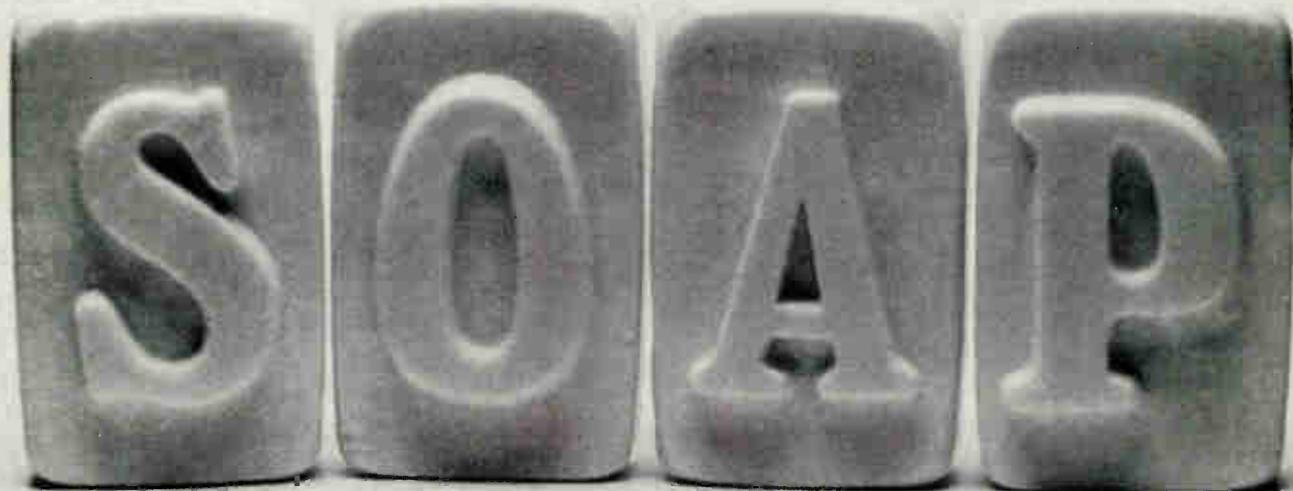
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ON LOCATION *Broadcast Communications'* video production editor goes on location to cover the latest developments in broadcasting.

PRODUCTION IDEAS MAKE



UNIQUE

By Ron and Susan Whittaker

To its many viewers around the world, *Soap* conjures up the image of a ribald TV series with a cast of eccentric characters. But there is another story behind *Soap*; one which has been overshadowed by all the hoopla about the show's controversial subject matter.

Consider, for example:

- *Soap* is the most expensive sitcom being produced;
- it has the largest regular cast of any TV series;
- it uses more regular sets than any sitcom in television (40 of them this season);
- it is the only prime-time serial on television;
- it employs an unorthodox lighting approach; and

Ron Whittaker, Video Production Editor, is the coordinator of television and film at Pepperdine University, Malibu, California. Susan Whittaker is a project development associate for The Triseme Corporation, Hollywood, which works exclusively with ABC Television.

• it diffuses and processes its video to look as much like film as possible.

Although in the United States *Soap* is enjoying a comparatively calm second season, this ABC production had anything but an inauspicious beginning.

To, first of all, get the series into historical perspective, one of the writers put some questions to Susan Harris, the creator, writer and producer of *Soap*. Harris, the creative force behind the series, was quite candid in responding to questions.

BC: When did you actually come up with the idea for *Soap*?

HARRIS: *It was several years ago. Paul [Witt], Tony [Thomas], and I were doing pilots together. They would produce and I would write. We had a series called Fay, which didn't last too long, and I wanted to do a continuing story. I thought it would give me a luxury as a writer that I didn't have in the regular sitcom format - not to have to tell a complete story in 23 minutes. I could have scenes about nothing; they wouldn't have to progress the*

story; they could just be good talk scenes. That is heaven.

BC: Besides wanting to tell a continuing story, what else was behind the notion of *Soap*? Were you trying to parody the daytime soap operas?

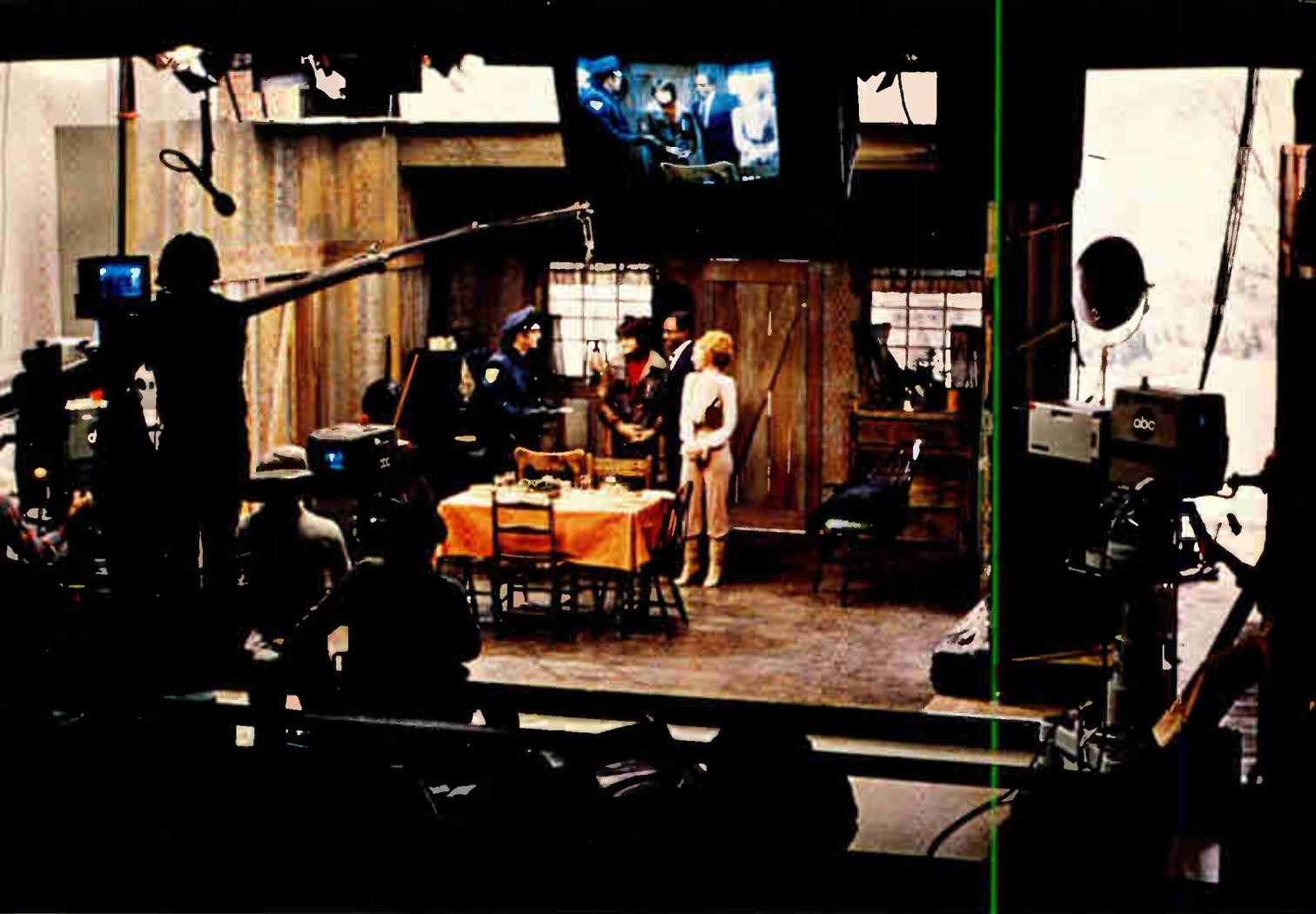
HARRIS: *No, not really. The characteristic was that it was a serial. It started with two sisters and then we just filled in their families and it grew and evolved.*

BC: How did you present it to the network?

HARRIS: *I went in and told them the idea and they said go ahead and write a script. So I wrote a script and a bible. The bible was just to show what could happen to each character and where the stories could go. Then we made the pilot. It was difficult to do. There were 14 characters to introduce and tell stories about in that first hour. Casting took close to four months. But they [ABC] loved the pilot and said we were on the air.*

BC: So it wasn't a hard sell to the network?

HARRIS: *They knew there would be*



Jessica (Katherine Helmond) and Benson (Robert Guillaume) try to convince an inquiring policeman that they are just an ordinary married couple (vacationing at the cabin of an escaped convict). "Son" Billy (Jimmy Baio) looks on.

problems because it was kind of sophisticated in certain areas. They had no idea it would turn out the way it did. We had more problems than we anticipated.

BC: What was leaked to the press that started the uproar?

HARRIS: *Nothing was leaked. Some people thought that it was network hype, but it was nothing of the kind.*

Soap, which is starting its second successful season in the United States, is seen in numerous other countries including the Federal Republic of Germany, England, Sweden, Canada and Japan. Because of its extensive production demands, it is currently the most expensive sitcom being produced in the United States. (Photos by Ron Whittaker)

It was a Newsweek article that said we were going to do things that we never in fact did, or even intended to do; like seduce a priest in the church and things along that line. They never checked their facts; they just wrote it. The Catholic Church picked up the article and banned the show. It was really an intensive campaign with letters, telegrams, phone calls, etc.

Then the Southern Baptist got on it and all summer long more and more groups jumped on the band wagon. Journalists had nothing to write about that summer, I guess, so they made Soap a dartboard. All those people clamoring for Soap's removal had never seen it; it hadn't been on the air yet! We were really stunned. What they were asking for was something really very dangerous: prior censorship. What really disappointed me more than anything was the press. If anyone should be concerned about

Continued on page 26

pre-censorship it should be them. Not many people picked up on that though. It was all written in a sensational way.

BC: Did you feel at any point that the network would renege on their commitment?

HARRIS: No, but it was always a possibility. I guess I wouldn't have blamed them if they had. It would have been purely an economic decision. And, actually, I would see

networks doing that. I have to say they were real courageous.

BC: Has all the flak died down now that the show has been on a year?

HARRIS: Yes, we never get any letters of complaint now — ever. But in the beginning it sure wasn't that way though: you should have seen the crazy letters people wrote. And, remember, that was before Soap was even on the air. When we started shooting the pilot it was with armed

guards on the set!

BC: Has there ever been any pre-censorship by the network? Is there any topic you can't touch?

HARRIS: Not really. They deal with us like any other show. You hand them the script and you get notes back. You win some and you lose some. They have never said there was a topic we couldn't touch.

BC: But wasn't there a problem recently with a scene where all the

Achieving the "film look" in Soap

It has been said that the video in Soap looks more like film than film does. Much of the credit for this (or blame, depending upon your viewpoint) belongs to Larry Boelens, the lighting consultant for the series.

"Most of the people in the film world say how good Soap looks, but a lot of people from video don't like what we do; they say, 'we spend millions of dollars making video sharp and crisp and you come along and destroy it.'"

How is the soft video effect achieved? First of all, all four cameras shoot through Tiffin #3 low contrast filters which alter the brightness range and give a decidedly diffused quality to the video. "We don't run any contours or enhancement in the cameras," according to Boelens. "I'm trying to lose the video 'edge' and make it look like film. Soap is probably the nearest to a film look of any [taped] show. And the general consensus from viewers is that they like the look of Soap; it stands out; it's different looking."

Lighting also plays a major role in the "Soap look." "With most video [shows] sets are lit so brightly that everything is sharp; focus is everywhere, and it just pulls everything together." To give a maximum selective focus effect, light levels on Soap are so low that cameras are run wide open at f:2.8. Key lights total 100 to 150 footcandles (900 to 1,400 lux) and fill light ranges from 50 to 75 footcandles (465 to 700 lux). In fact, the light levels on Soap sets are reminiscent of lighting used in network studios in the 1960s for high-quality monochrome IO cameras.

Running cameras wide open "is hard on camera operators," according to Boelens, "because depth of field is at an absolute minimum." But since

foregrounds and backgrounds are typically out of focus, the effect adds to the film look.

Another unusual aspect of the Boelens approach is key light placement. Most lighting directors key from the front of sets. Boelens keys from the rear.

There are several technical and artistic advantages to placing keys in the rear corners of a set. First of all, boom shadows, the lighting director's curse, are virtually eliminated. Since the fill light (at the front of the set) is extremely soft and diffused, shadows on backgrounds are virtually nonexistent. This also means that back-

grounds will not be over-lit by keys; in fact, Boelens steers away from specifically lighting background areas whenever possible.

But how about the effect of these lighting angles on modeling? Actually, the traditional key and fill angles remain, since key lights end up being 45 or so degrees to the side of the cameras getting close-ups on each side of the set. And fill light appears — just where it should — on the opposite side of these camera angles. The only weak camera angle, as far as lighting is concerned, is straight-on (perpendicular to the back wall). But, typically, this viewpoint is used more



Burt (Richard Mulligan) tries to cover his embarrassment after his jilted girlfriend creates a noisy scene and storms from a restaurant. This set represents one of 40 which had to be created for this season's Soap series.

female characters were gathered in the kitchen discussing their sexual needs?

HARRIS: *There were problems when they got that script. The Standards and Practices people were upset. They said we couldn't do it. It was a fight like we have every week. But we got them to come down and look at it. It is often very different reading something and then seeing it played out. We said you have to hear Katherine Helmond say the lines. In*

for wide shots.

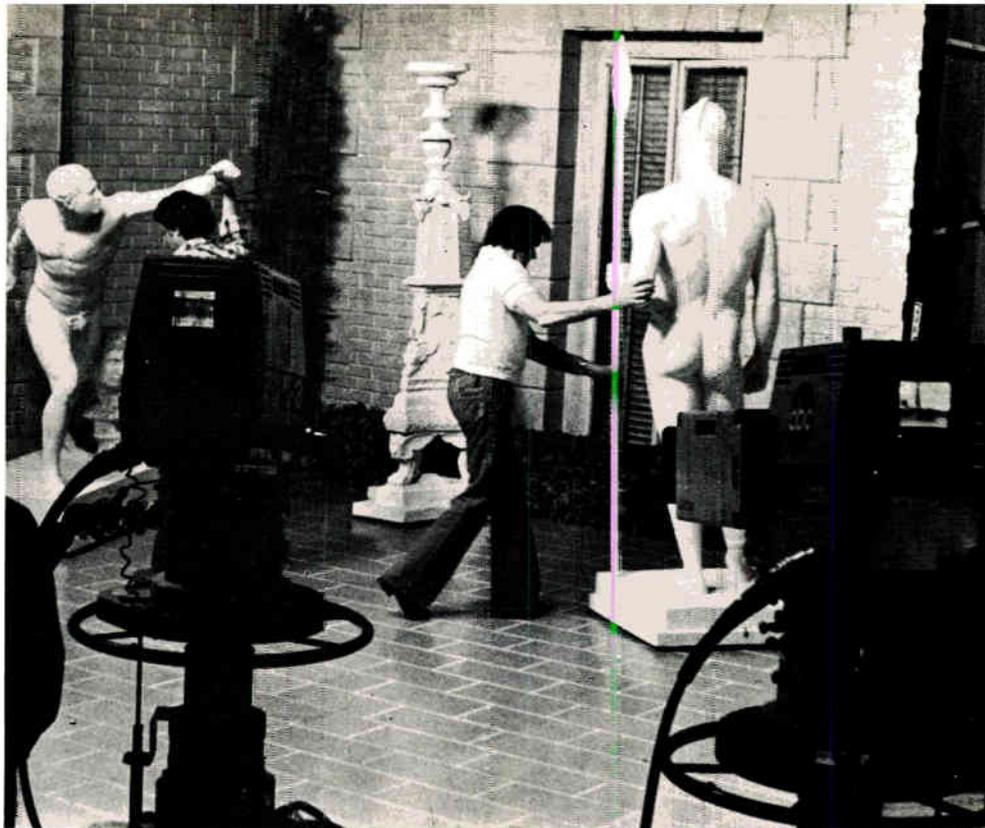
Since lens flare is a constant problem with this key light arrangement, Boelens and ABC lighting director Alan Walker make ample use of flags and cards to provide sharp cut-off points for lights. Typically, two to four 5-K Fresnels are used on each side of the set for keys.

Also, with keys placed at the back of sets, they end up doubling as backlights; the key lights for the left side of the set double as backlights for the right side of the set and vice versa. This economy in the use of lighting instruments is, in fact, what Boelens strives for. "I like simplicity in lighting; I hate multiple shadows, and we rarely see them in *Soap*."

Boelens lights areas, not actor positions. "I light a set without taking into consideration where the actor will be. I try to light so that anywhere actors go they will look as if they are in natural light of the room."

Critics of Boelens' approach point out that there are often dark areas in scenes, with some areas being hotter than others. "I have a tendency to let people fall off downstage when they would be right next to where the fourth wall would be. I'll let them go out of light occasionally. I try to make things look as real as possible, just the way lighting would actually be in a certain situation. Most people in video strive to make the light even across the set."

In considering his basic lighting approach — a technique which he developed while working at such film studios as MGM, Paramount, and Warner Brothers — Boelens said: "I've always thought you get the prettiest photography when you let it all hang out; when you are working on the ragged edge. Anybody can produce safe, clean video or film, but it's at that ragged edge where you often find some magical photography."



Props are quickly rolled into place for a museum set on *Soap*. Over 40 sets are being used this season — more than any other series on U.S. television. Since the show is taped in front of a live audience, many sets are constructed so they can be rolled into place during breaks in taping.

her character it is done with such innocence that it is adorable. There is nothing lewd about it. They saw it at rehearsal and said "fine." They reserved the right though to approve it after taping.

Then the heads of ABC saw it and said, "We're going to get clobbered." But they close-circuited it to their affiliates and there were no complaints.

BC: Are you the sole writer on *Soap*?

HARRIS: *No, thank God! The first season I wrote all 25 episodes. It was almost a physical impossibility. It was too much. I felt like I was ready to be hospitalized. We have since hired Stu Silver and I feel almost like I'm on vacation. Even though I am still working very hard, it is much easier by comparison. Tony, Paul, Stu, and I meet weekly for a story conference and then Stu and I divide up the script.*

BC: How much influence does audience feedback have on what you do with the characters?

HARRIS: *Generally if the audience loves them we will too, so we won't consider dropping them. We had no idea though that Chuck and Bob (a ventriloquist and dummy) would go as far as they did. The first time we introduced them, Paul and I looked at each other and said, "America could turn off their TV sets when they see this." We were asking a lot of people to buy that character. We didn't even know how we felt, but now we love them. They were never supposed to*

have lasted as long as they have. Now we wouldn't be without them. I'm crazy about that dummy. So it does happen.

BC: What about ratings?

HARRIS: *I am very aware of what the number are every week, but there is nothing I can do to change them. That is frustrating. There is also no way to know why they are as they are. They do determine whether you stay on, but all you can do is make the show, and after that you're impotent. If we knew exactly what they [the public] wanted we would be making a fortune. We could have 10 hit series. You just don't know. Sure, we have a sense of what is commercial, and some decisions can be based on that.*

BC: Do you ever feel when you get through a week that a show really wasn't as good as it could have been?

HARRIS: *Sure. You never have enough time in television to do things really right. I was writing last night and thinking that if I had a week to work on that scene I could make it brilliant. I had only a few hours. I know where I am compromising. Television is at best a compromise. And you know that up front, so it doesn't make you crazy.*

Harris' comments notwithstanding, it appears that there is not too much compromise in the area of production. The three producers and director Jay Sandrich have designed the series to have a special "look" and

Continued on page 28

quality about it. (See related story on how *Soap* achieves its film look.)

One costly production area for *Soap* is represented in its sets. An entire jumbo-sized ABC sound stage in Hollywood is dedicated to this one show, and this doesn't even include the space required to store the 30 or so additional sets and associated props. And, using up to 13 sets for a single episode, while at the same time taping the show in front of a live audience, presents some challenges.

Production designer Ed Stephenson is in charge of sets. Last year he won an Emmy for his work on *Soap*. Stephenson, who has done the production design for such shows as *Sanford & Son*, *What's Happening*, *Good Times*, *Carter Country* and *Maude*, has won two other Emmys: one for producing *The Andy Williams Show* and one for set design in the first Fred Astaire special.

However, Stephenson considers *Soap* his most challenging and creatively-demanding series. While maintaining and even establishing new levels of design quality, these sets must roll into place easily and quickly,

and then break down for storage. Since the studio audience's viewpoint is limited, sets are made so that they can be rolled into view whenever possible during the taping sessions. Lighting, therefore, must often serve more than one set.

But, even with the special mechanisms necessary to accommodate moving and storage requirements, Stephenson makes it a point never to let mechanics interfere with the look of a set. According to Stephenson, his first consideration is always to be dramatically correct; to be true to the mood and action of a scene. He then looks to add a "special quality" to reflect the personality being projected by the actors associated with the setting.

Working with Stephenson are three assistant art directors. Other people are hired as needed for special work. All four work closely with costume supervisor Judy Evans, lighting

In the dim light of the control room, the production crew is seen during the second taping of a *Soap* episode. From the left are: Gerry Bucci, technical director; Jay Sandrich, director; "JD" Lobue, associate director; and Marsha Posner, script supervisor.

consultant Larry Boelens, and lighting director Alan Walker.

Soap also has on staff four full-time wardrobe people — all clothes are handmade for *Soap's* female cast — and four people to handle props. In total, *Soap* employs 65 staff and crew members.

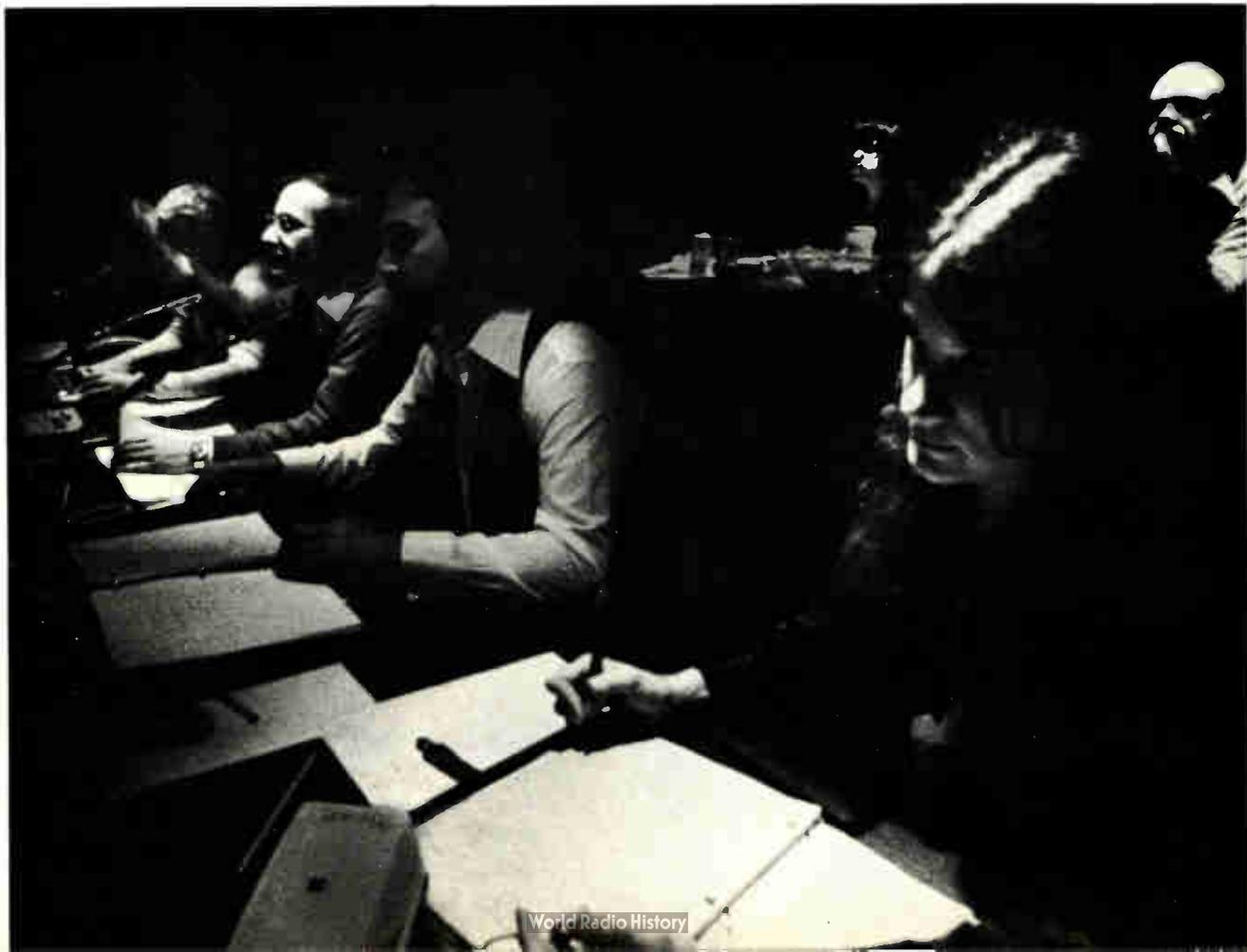
The primary responsibility for directing the performances of the show's 20 cast members falls on director Jay Sandrich. Sandrich, who came to *Soap* from *The Mary Tyler Moore Show* (where he won two Emmys), was questioned about his role in *Soap*.

BC: How do you approach your job as director?

SANDRICH: *I try to look at each scene as the audience will look at it. I figure if I am amused they are going to be amused. If I'm bored then they are going to be bored. If I don't understand a scene, why should the audience understand it? I can only apply my own standards.*

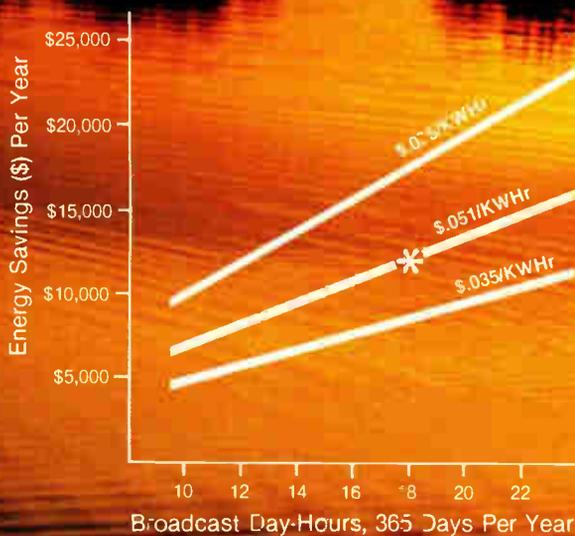
With that as the undergirding philosophy, the *Soap* cast meets on Monday mornings with the director,

Continued on page 30



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producers, and writers for a cold reading of the script.

SANDRICH: *We can tell immediately if something isn't working. The writers can then go upstairs and rewrite it. We will go ahead and stage maybe the first three scenes and then the producers will come down to look at them. We'll discuss the actors' attitudes, movement, lines, etc., and change as we need to. On Tuesday we'll do the same kind of thing and finish the day with a complete run-through. From that we can get our running time and know whether we have to cut anything. Usually we try to be no more than two minutes long so that we don't have to butcher anything in post-production. Wednesday is for restaging, rehearsal, and more feedback from the producers. By the time we go home that night the show is pretty much as it will be for taping.*

BC: It seems that most of your involvement is with performance rather than with technical things.

SANDRICH: *A large part of my job, maybe 70%, is being involved in the acting, the storytelling process. The timing, delivery, and reactions are critical in comedy. Later in the week when we do camera blocking it will be more technical, and on tape day it will be 50/50. A successful comedy director has to be good in both.*

One reason I think that comedy hasn't reached the heights it can, is because the directors are not allowed to function by the producers. On this show the relationship between the director and producer/writers is very collaborative. There is no difference in my mind and theirs between the director and producer. We all have a common interest and the same goal. They are much more involved in the stories, writing, and the final editing. I am more involved in the staging and acting. I have great respect for their tastes and talents, and they for mine. On other shows the director often has to fight with a writer if a scene isn't playing right in order to get it adjusted. Or producers may come down and try to restage and redirect, which undercuts the director completely.

The technical aspect Sandrich refers to starts on Thursday during camera blocking. *Soap* iso's all four cameras and also does a switchfeed. After blocking each scene for the cameras, Sandrich, associate director "JD" Lobue, and script supervisor Marsha Posner, will make script notations indicating cameras, shot composition, and cuts. Lobue will then prepare shot

sheets and review the scenes with the cameramen. Then there is another full camera run-through for the producers.

The cast and crew have two more rehearsals on Friday before the first studio audience sees the show in the late afternoon. The afternoon show is considered a dress rehearsal, even

At the conclusion of tape day, $\frac{3}{4}$ -inch cassettes and 2-inch copies of the two switchfeed shows have been recorded, the iso'ed outputs of the four cameras, and a reel of "pickup" shots.

To allow maximum editing flexibility, the final air programme will



Director Jay Sandrich ponders a sequence from *Soap* during one of the breaks in taping. On the left is technical director Gerry Bucci.

though portions of the final edited show may be drawn from it. This first performance gives the director and producers a better sense of where the laughs are, what acting adjustments are needed, etc. During the dinner break between tapings, the director and producers go over their notes on the first show with the cast and discuss improvements. As you look around the dining hall you notice the various actors trying out the suggested inflection changes or reactions as they finish up their meal. There is no time for another rehearsal. A short time later a new audience is moved into place and they start from the top.

SANDRICH: *The first show helps me also from a technical standpoint because I will try to remember the intensity and placement of the laughs from this one to improve on the cutting in the next show.*

With tape you can easily and inexpensively do two shows, which gives you more choices in post-production for selecting the best performances, cameras, and even laughter. It is amazing how different the reactions between the two audiences can be. In film you frequently won't have this advantage because it is just too expensive.

be assembled entirely from the iso tapes. The switchfeed versions are used only as a reference for editing. Sandrich and executive producer Tony Thomas make the initial editing decisions. The two switch-fed shows are screened side-by-side to select the best takes. The editor makes time code notes to specify the camera shots and audio sequences finally decided upon.

Audio is recorded on four-track tapes, which provides maximum flexibility in controlling and mixing the various audio inputs. This means that a laugh from the first show, for example, can be used with the comparable scene from the second. In post-production sweetening, additional laugh-track sound will occasionally be used to maintain balance between segments.

According to Don Ricetta, the post-production supervisor, it takes 12 days to assemble a show. A typical show will contain 500 video cuts.

Soap, which is a Witt-Thomas-Harris production, is currently finishing its second successful season in the United States. Other countries running the series include Canada, Japan, Sweden, Germany, and England.

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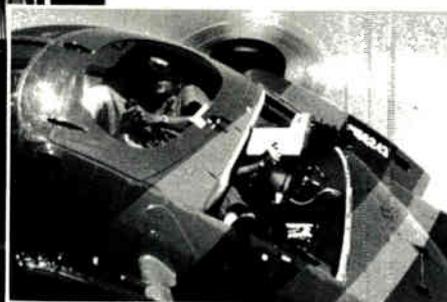
program to maintain a versatile mix of the highest quality 16mm film and electronic field production equipment available today.

In addition to its existing CP-16R camera equipment, Pacific Focus has

recently acquired two MNC-71CP video cameras with all the ancillary equipment needed to convert them to MNC-710CP studio/field production configuration.

"We shoot video or film, depending on what would best serve the needs of each particular project," says Dennis Burns, award-winning producer/cameraman and president of Pacific Focus. "In Hawaii, though, we produce on location almost entirely. So it's important that our broadcast-quality MNC-71CP cameras are rugged enough to take the kind of abuse that the CP-16R can take.

"Combined with the versatility and cost savings provided by Steadicam, which can be used interchangeably between our CP-16R and MNC-71CP cameras, there's no assignment we cannot handle!"



"The Steadicam camera stabilizing system lends itself to many innovative uses," says Dennis Burns. "For instance, by placing Steadicam on a special mount (built by Bud Weisbrod of Pacific Instrumentation — the CP dealer in Hawaii) and rigging it to a forklift, we were able to simulate boom/crane capabilities.

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World Radio History

In French television . . .

Film techniques improve video production costs

By Bernard Pauchon

The technologic improvements which have occurred the last three years (such as one-inch VTRs, self-governing cameras, and computerised editing systems) have

Bernard Pauchon is an engineer with the Société Française de Production (SFP).

authorised the conception, especially for feature production, of an original production technique called electronic cinematography.

We admit that for shooting an event which has just occurred, or transmitting a show live, video with several cameras is the ideal working

tool. However, in spite of some brilliant attempts to find a new video style, film has remained up to now better adapted for drama productions.

In the last few years, we have observed the following:

- Video has been sidetracked for

Continued on page 34

Two mobile control desks are used on the set. This is the director's desk in front of the video monitors.

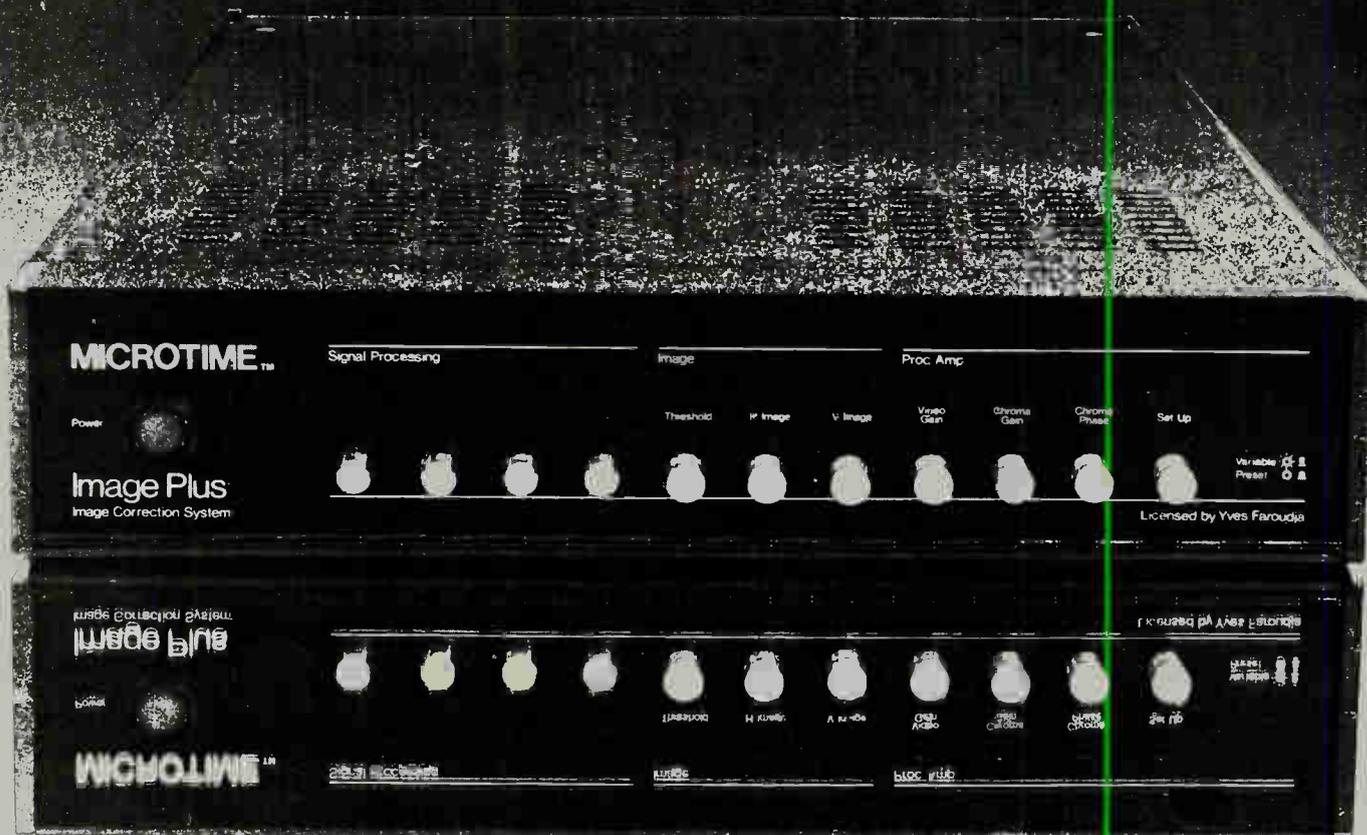


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the profit of film, mainly due to greater flexibility; and

- Video costs increased considerably because the productivity (finished programme minutes) per employee decreased: the equipment used was still heavy and the technical crews were rather large.

But, it is possible to make video production cost effective — by using the film methods with an electronic camera, and by taking advantage of

the development of video post-production techniques.

Shooting. By working with a portable camera, mounted on an Elemack pedestal or a crane, we can unite the flexibility of film shooting and the advantages of video — without having to put up with a few of its drawbacks (the bulky equipment). The team is reduced; and, it's more homogeneous and less scattered. Here's how it

works:

- The director works on stage only. There is no longer a control room. He directs the talent better, without wasting time.

- The sound recording is done right on stage, similar to the film method.

- Shooting with one camera means less impediments for lighting and sound recording. So the setting is faster, and the quality better (because to shoot simultaneously with four or

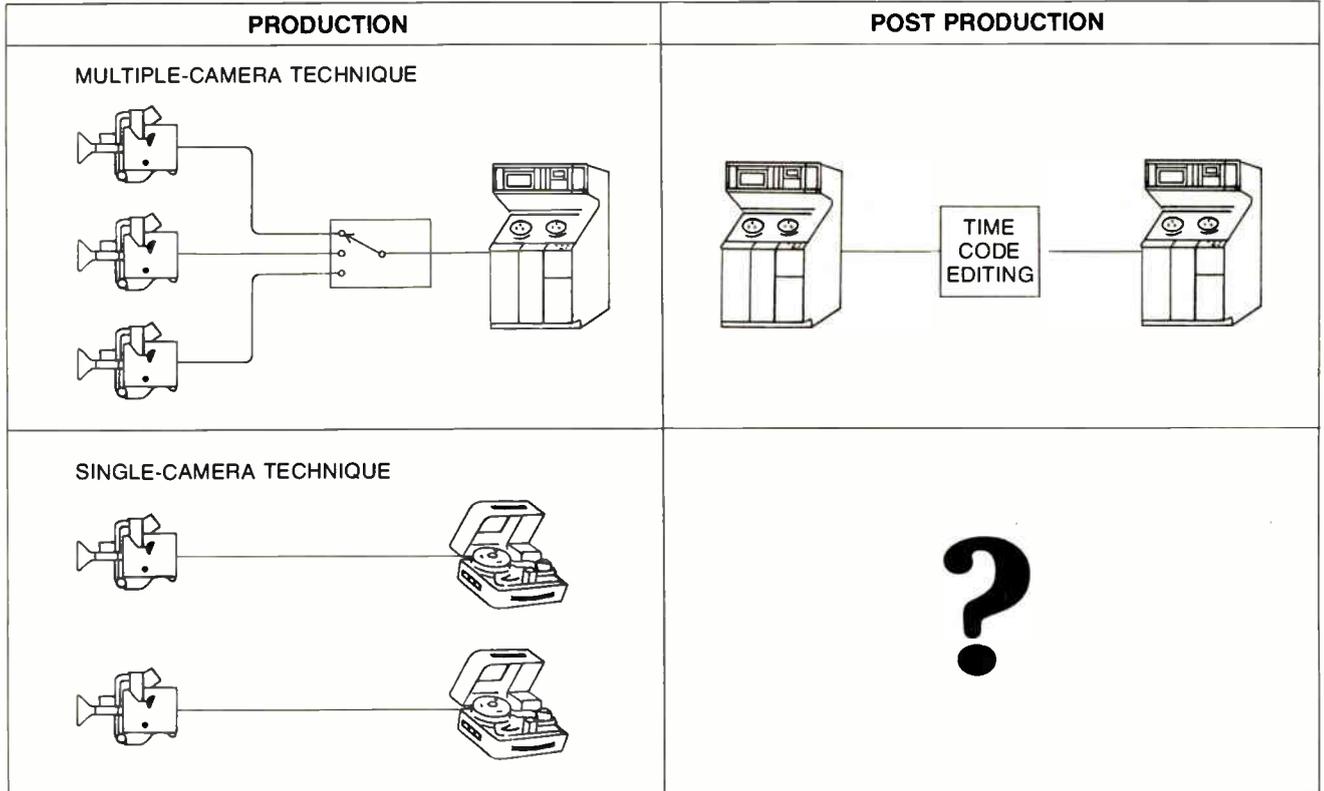


Figure 1

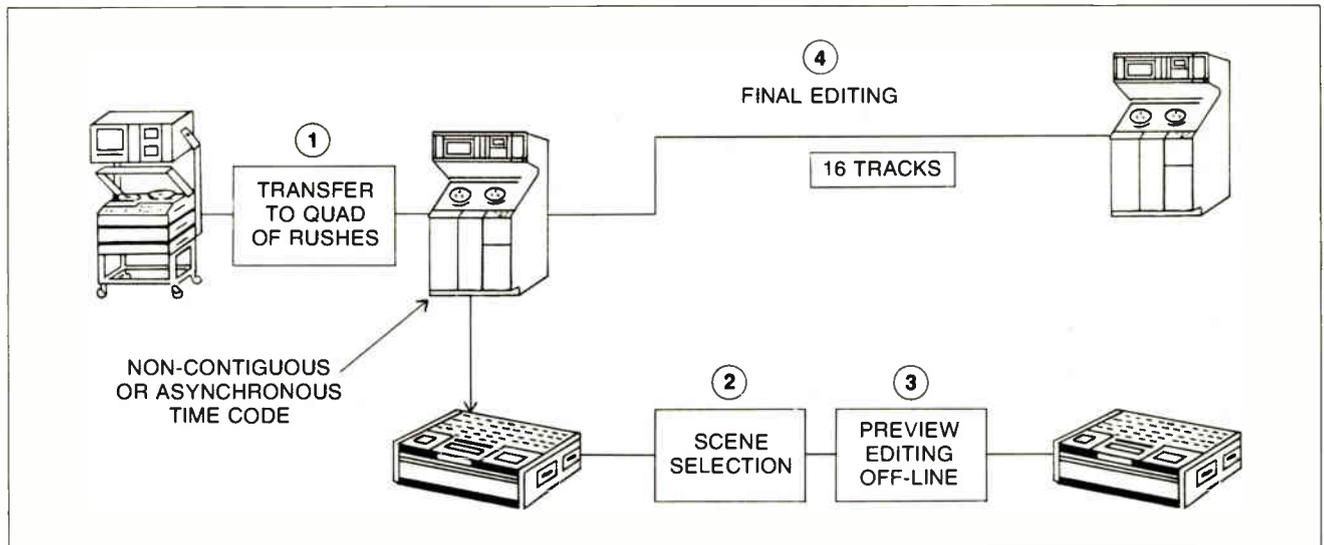


Figure 2

five angles means compromises for light and sound).

- On the stage, a lightweight one-inch VTR of broadcast quality is fed directly by the camera.

- A second camera and a second VTR can be added for some well-determined phases of the production. This is similar to a "second film unit."

- Immediate checking of the picture while shooting or during playback.

- No surprises when the rushes are discovered.

- No laboratory costs.

The package which is more reliable than film, has been designed so that it could be as light, and more flexible. There were at the beginning three main ideas.

First, the standard equipment is composed with one camera and one VTR, but can receive additional elements to obtain two other configurations (two cameras/two VTRs or two cameras/one VTR).

Second, SMPTE time code during shooting and playback is used so that the continuity girl can prepare the out-take job.

The final idea was that self-governing and lightweight equipment which can be easily transportable is used, not only in a TV centre, but on film sound stages or outside in a very lightweight vehicle.

Stage Equipment. There are two mobile desks on the stage — one for the director, the other for the sound engineer — which are connected to the technical equipment which takes place either in a corner of the stage or in a room close to it. Lighting is done exactly as it would be for film.

The director's desk has one or two colour monitor(s) showing the picture(s) of the camera(s). There is a microphone for communication with the camera team (to order record mode for the VTR, for example). The continuity girl can also insert the time code to get the reference of the good or bad shots.

The sound engineer's desk is similar to those in use in film, but with small black and white monitors to give a view of the camera picture.

Technical Equipment. The basic equipment is composed of two small mobile cabinets, mounted on wheels. The first one contains the IVC 7000P camera pack, the portable one-inch VTR BCN 20 and a black and white

Continued on page 36

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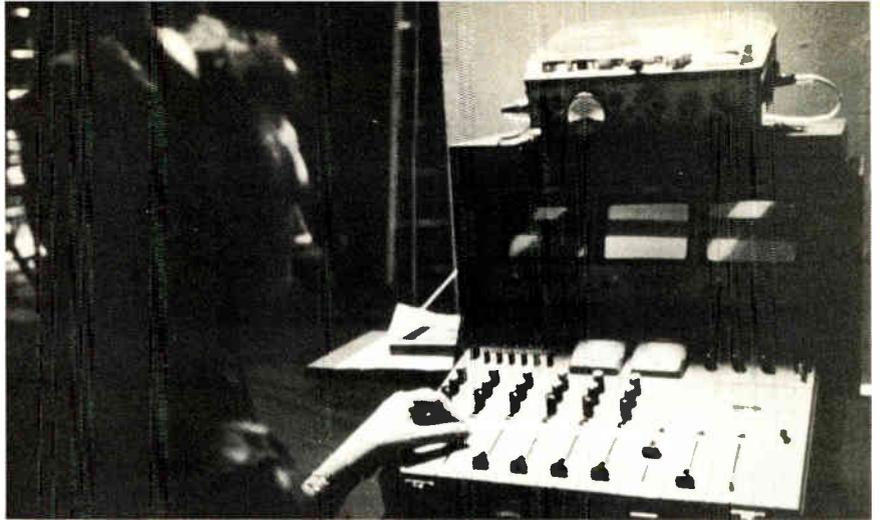
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monitor; the second one with the electronic ancillary equipment (intercom, time code generator, switcher, oscilloscopes, etc.) and a professional colour monitor. Of course, we can add a third unit containing a second camera and a second one-inch VTR. All those parts, including the stage consoles, are linked together by a single cable which can be quickly detached, and makes this equipment easy to move, or to set up. This equipment is completely mobile, with its own generators for time base and SMPTE time code. It is even able to work on portable or car batteries, so that it can work everywhere; on a sound stage, outside in a light van, or anywhere else where power cannot be provided.

Shooting. When shooting a show, the director stays on the stage with the actors. Two video engineers take their place with the technical equipment to control the VTR and make colour corrections. (Since the equipment works usually in SECAM, this has to be done while shooting because post colour corrections are not so easy as in NTSC.)

Everything goes like film. Even an ordinary sound stage is used, but the immediate video control allows the director, photography director, and



The sound engineer is shown operating a portable console, while he keeps an eye on the video monitors.

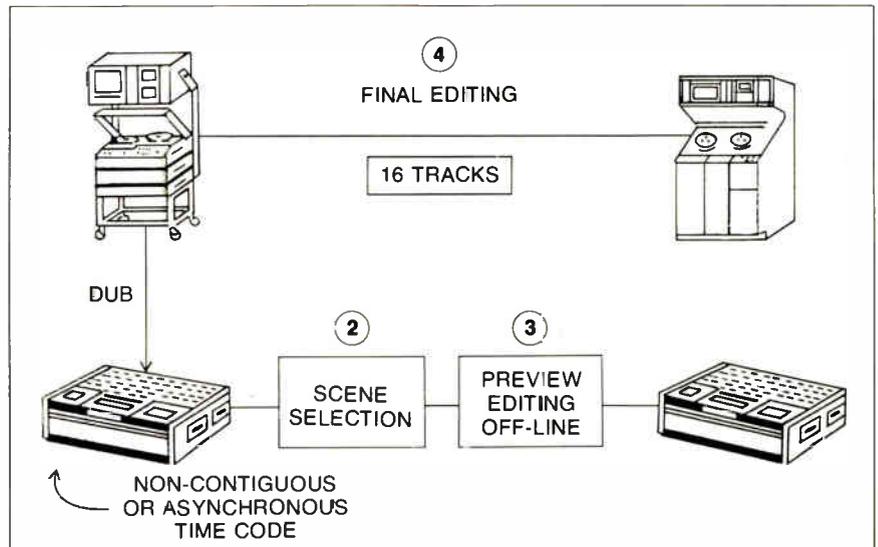


Figure 3

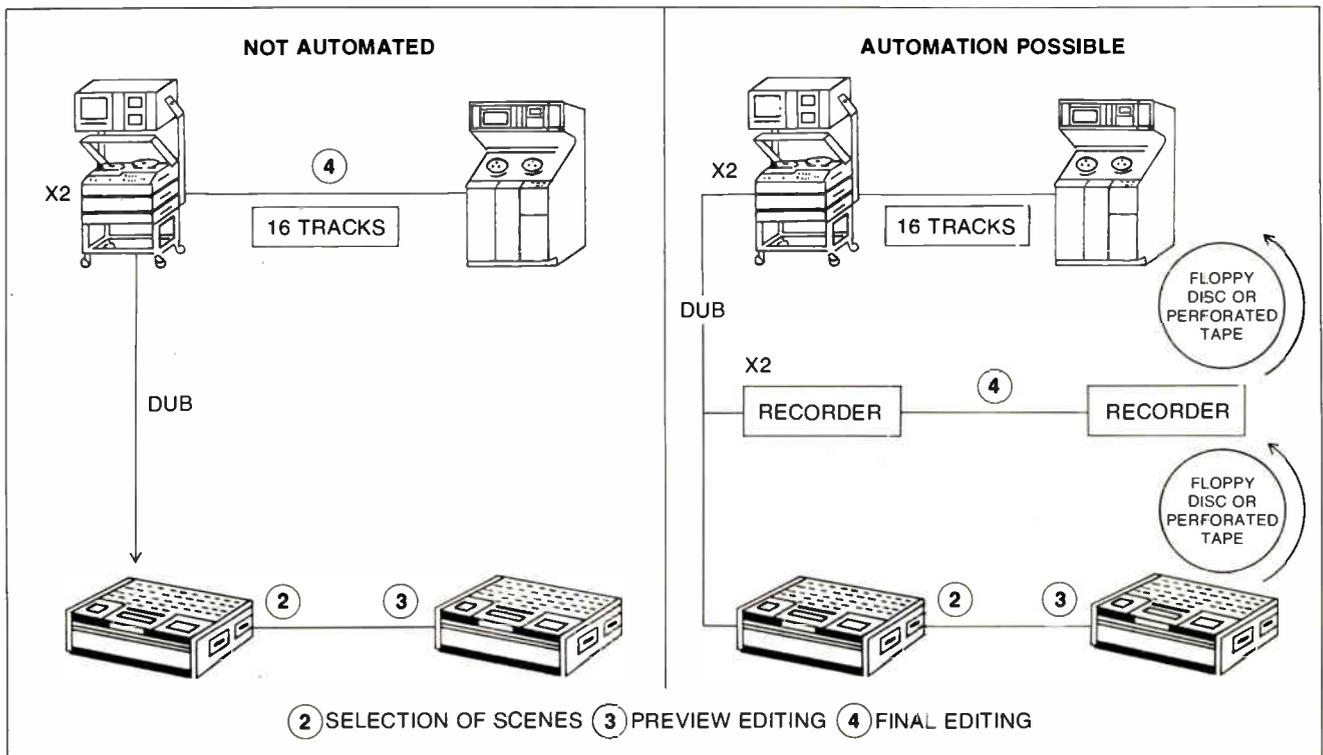


Figure 4

makeup girls to concentrate on the artistic side of the production, while the continuity girl may insert the time code for logging the different shots.

The equipment has been designed in such a way that it can work as well in PAL as in SECAM just by changing the encoding board in the camera unit. This has been done to provide a picture which can be better transferred from video to film for large screen projections.

Two film directors have already used this new technique, and both are enthusiastic about it. They are Michel Boiron for a six-hour miniseries, "Offenbach," and Gabriel Axel for a 90-minute TV special, "The Night Watch."

So, this electronic cinematography technique, for sound stage or outside shooting, combines the advantages of video with the flexibility of film. It gives the directors (who may never have dealt with video technique) the best instrument, with a greater profitability than in film. (For an equal quality, shooting directions can be decreased by an average of 15%, which means substantial savings in production costs.)

Post-production. To this day, the French TV VTR department is only equipped with conventional editing systems (such as AE-600 from EECO/RCA), with two, two-inch machines per editing room. It is sufficient for the usual five-camera studio post-production, but it is not an adequate editing system for productions shot with the single-camera technique (see Figure 1). Nevertheless, Figure 2 shows the way we have done this production. (Figure 3 shows the way we could have done it with a one-inch/two-inch editing room). In both cases, the pre-editing is done with a control track Convergence ECS-1 editing system.

To tell the truth, this way of operating gives an important and cumbersome job for handling time codes. And the job that can be done with an editing system base on control track pulses cannot exceed an average of three or four days because, afterwards, accuracy is required. That is why we intend to go to a computerised amended version of Figure 3 as shown in Figure 4.

The basic principle is: Why use expensive equipment to do a job you could as well do with a less expensive one? That's why we intend to go to such a post-production system in 1979

which seems to be able to solve the technical problems (provided adequate software will be available). This gives good hope for getting a good way of working, technically speaking. But what about economics?

Although we have not used the ideal system for achieving post-production, we have learned a great deal about the time required for each step of the post-production job. That is why those

elements have made us able to make a first comparison between the film costs and the electronic cinematography costs. The first results give us at least some very good hopes, so we intend to go further to check the final results against our plans. But we are already quite sure that electronic cinematography will undergo considerable development in the next few years.

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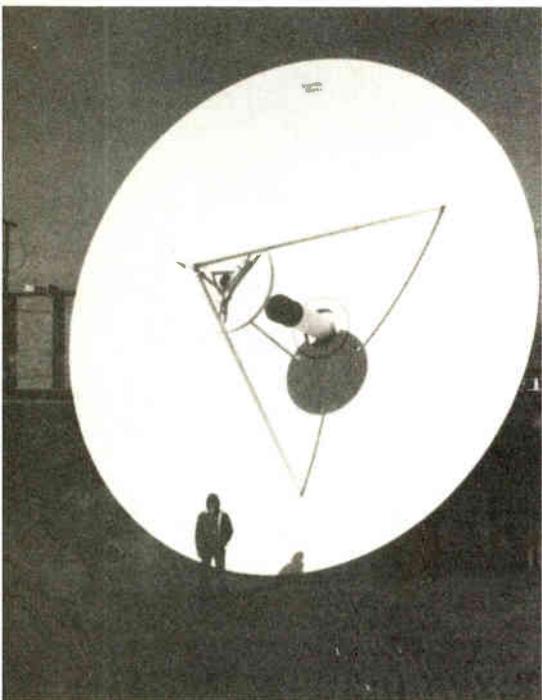
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Executive Notebook:

How to manage your way into earth stations

Part 2/By Dennis Ciapura



Greater Starlink technician Frank Ramo appears dwarflike (he is not) as 10-meter antenna system looms in background.

In Part I of this series which appeared in the November issue of *Broadcast Communications*, we explored the planning and economics of large earth station installations with a management perspective. A decision-maker's checklist was evolved, which could provide the framework for determining whether or not to build a common-carrier earth station at a given location based on technical factors that are directly related to cost of construction as well as raw equipment costs.

This month we will develop a similar checklist for the construction phase of

earth station implementation and also take a look at what it takes to get the marketing effort started.

The efficiency and reliability of the completed earth station depends heavily upon how many contingencies are accounted for during the construction phase of the project. In other words, the project manager must accurately anticipate what future problems might arise and build the problems out of the system. If the earth station installation is to be surrounded by an earth berm or counter-sunk into a pit as Detroit Greater Star Link was, then drainage must be considered before construction commences.

If a problem may exist, it is far better to equip the site with some degree of overkill in the drainage department rather than take a wait and see attitude. The results of flooding can be disastrous. Disastrous from a business standpoint as well as an electronic or a mechanical one, since if the station is to be a common-carrier facility, its clients will depend upon it for reliable delivery of programme services.

Similarly, in northern latitudes (or very, very southern ones) icing conditions should be anticipated and dish de-icing installed and tested well in advance of winter. Although this might seem like a statement of the obvious, remember that the earth-station hardware business is a very competitive one, and eagerness to generate attractive pricing sometimes results in a "no-frills" system which may not include some options that will obviously be required. In the case of Greater Star Link, the supplier was Scientific-Atlanta, a company which is very conscientious in counseling prospective users as to what options might be desirable.

The site security is another important consideration and one that should be given a fairly high priority. As large earth

station dish antennas are still a novelty in most communities, they naturally generate a great deal of curiosity. This curiosity is one of those "good news, bad news" stories in that while it engenders lots of free P.R., it also stimulates the curiosity of vandals and therein lies the problem. If the earth station is either countersunk or surrounded by a berm, the natural barrier formed by such an environment will somewhat discourage vandalism, as regress from the site is impeded post dirty deed. If the site is only partially surrounded by a berm, particular attention should be paid to the security of clear areas which would be the natural entrance and exit path.

Obviously, the equipment shelter should be equipped with good locks and a burglar alarm, if not manned 24 hours a day. Earth station entrepreneurs who are also broadcasters probably have

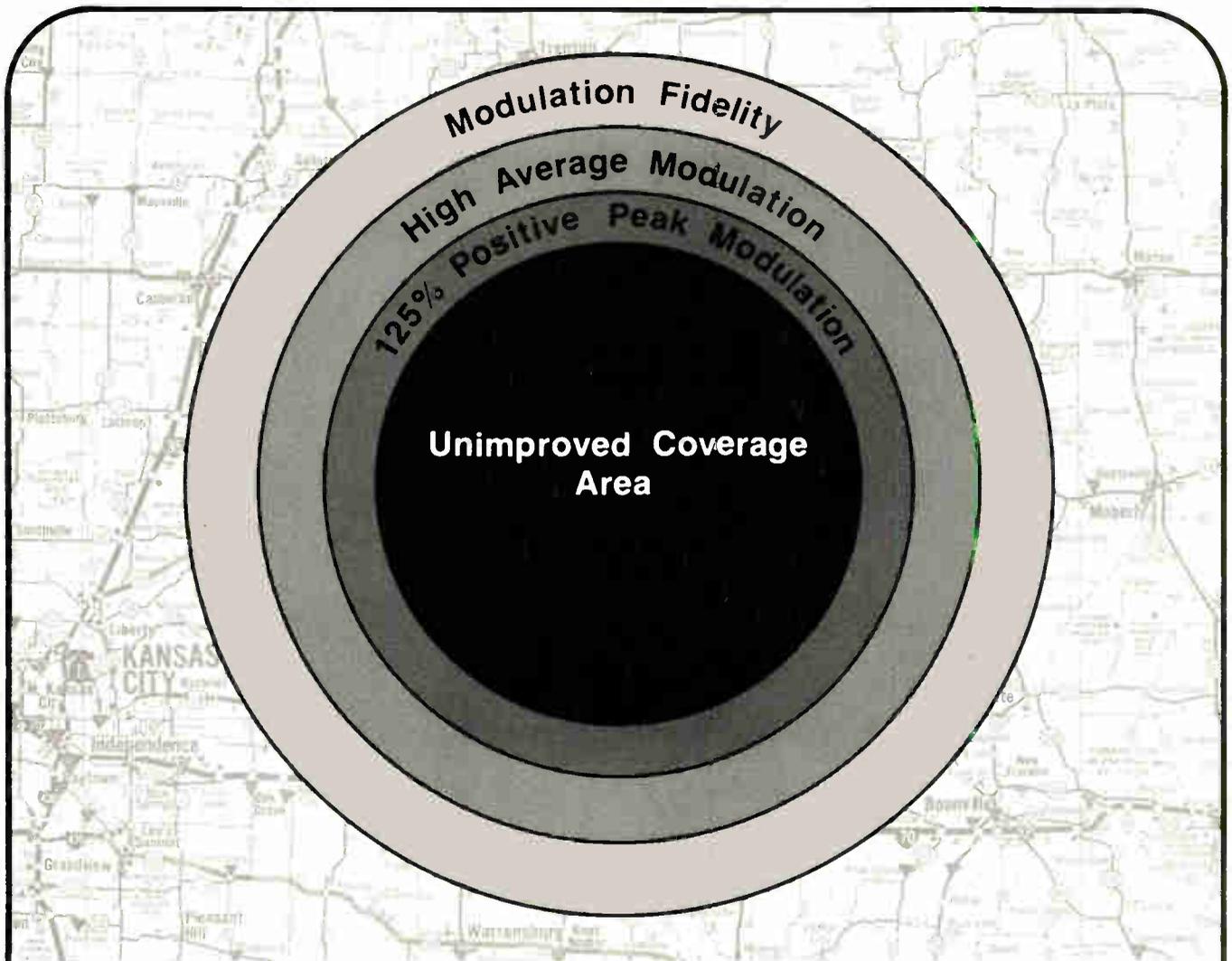
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ample experience in these areas, assuming that they have weathered many years of keeping radio towers in the intended vertical position.

Probably, the biggest security return per dollar invested comes from lighting. It is absurd to think that if the dish isn't lighted, no one will know it is there and flooding the area with intense light will certainly dissuade those vandals looking for an easy mark. Unmanned stations should also be visited as often as possible

and at staggered times to make it difficult for the serious intruder to schedule a visit.

Another area that needs attention during the construction phase is that of possible RF interference from other broadcast services. If the station is to be located near AM, FM or TV antennas, care should be taken to keep outside RF energy out of the earth station's circuitry. Remember, the fre-

quency coordination process only addresses itself to possible interference in the multi-gigahertz bands, which leaves the earth station licensee to predict other interference problems that may exist. One very effective and relatively inexpensive measure of protection can be obtained in the form of tower lighting chokes which when installed in the AC lines will suppress RF pick-up through the power lines, which is an easy route of entry for RFI.

Above-ground lines leading into the equipment shelter can make an excellent AM receiving antenna, thus feeding RFI in large amounts into the power supplies even though the earth station receiving equipment might have excellent rejection of these frequencies through the antenna circuit and RF amplification. In the end, interference is interference and how it gets into the equipment is of little consequence once it interferes with video reception. In the vicinity of strong RF fields, a metal or metal-sheathed building or enclosure is to be preferred over a wooden one and good grounding of the building shell can also be helpful. I am overstating the RFI problem somewhat; however, as only very basic and inexpensive measures can be so effective in preventing problems from cropping up in the first place, it seems worthwhile to place some emphasis on this area.

Once the project manager is satisfied that the construction phase of the programme is proceeding as planned and that all possible problem areas have been attended to in advance, it is time to resume the marketing effort which should have begun before the station was built. Assuming that the licensee has determined that adequate business potential exists to support a common-carrier earth facility, it is time to begin pursuing possible earth station users in earnest.

The common carrier sales business is somewhat different than traditional radio spot sales or retail sales in that we are normally dealing with people who are already in the business of programme distribution or reception and are usually already receiving satisfactory service by some other means such as a land line. In some cases, satellite distribution may provide an opportunity for expansion or may make it economically possible to do things that simply could not be done previously. But a prospective earth station user must be shown how satellite distribution is advantageous.

The first step, however, is to let potential users know that the facility exists, which is not always as simple as it

Continued on page 42

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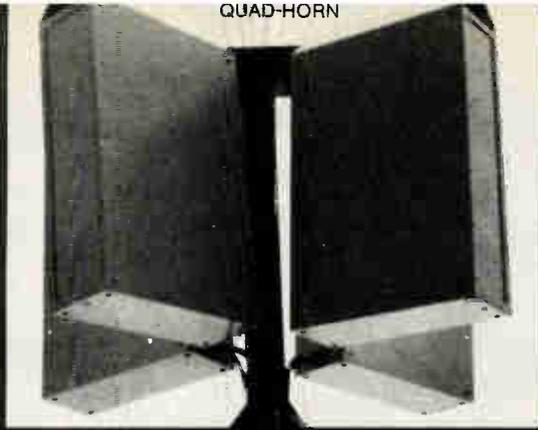
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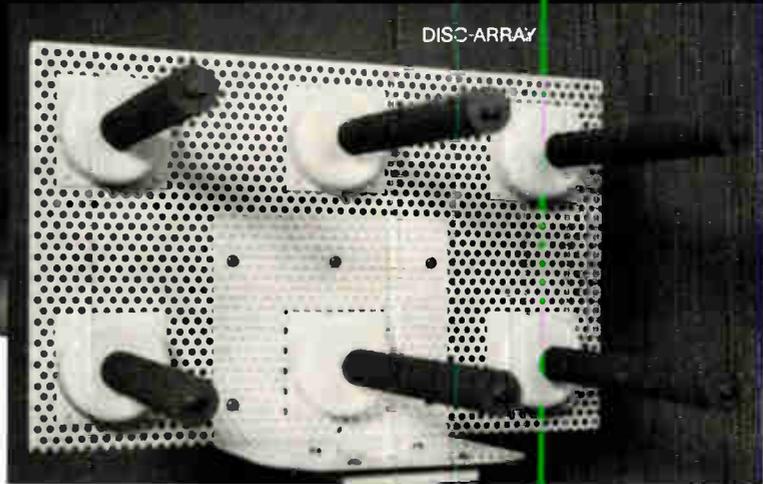


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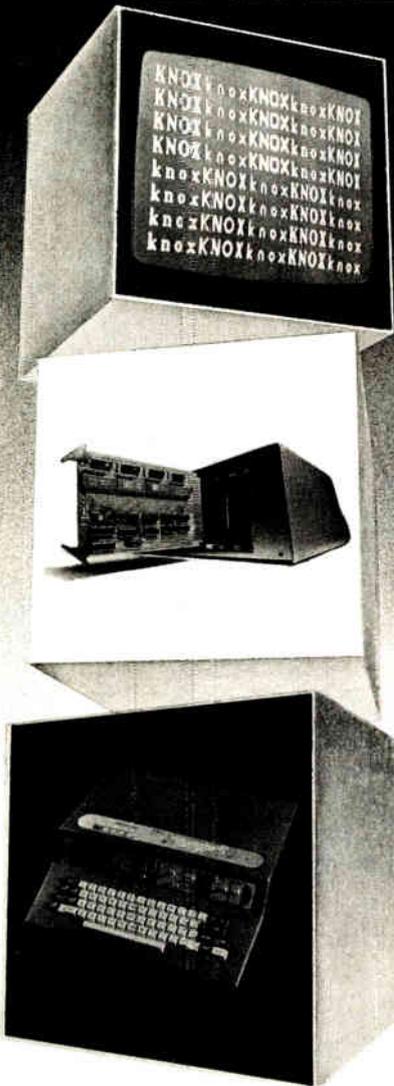
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Earth terminals

might seem. First, it is necessary to assemble a list of potential users in your area and nationally for the purpose of developing a mailing list. You must then set up an ongoing project of keeping these people informed of how construction is proceeding, when the earth station will be complete, and finally, when programme service can be delivered.

It is also helpful to have an expansion plan ready in advance to help clients determine who your common carrier facility can help with their future needs as well. This aspect of the marketing effort is extremely important as video programme distribution and voice/data communications take lots of prior planning; and it may not be able to turn somebody's project around on very short notice just because a satellite link is available.

Television programming for broadcasters remains the most obvious application for a common-carrier earth station, although a cable outlet may occasionally be in the market for a high-quality satellite feed from Satcom. However, most cablecasters are satisfied with lesser performance and will generally install their own 5-meter systems at the head end if frequency coordination is possible. Television broadcasters who are always sensitive to the slightest signal degradation are often amazed at the video quality available from a satellite feed from a 10-meter system and are going that route whenever possible, even though the Federal Communica-

tions Commission may allow 5-meter systems for broadcast.

One basic and important marketing decision that must be made sooner or later is whether to sell the common carrier facility directly or to assign the sales function to a rep. In some cases it may be desirable to do both. A growing array of satellite communications can be found in two-way voice/data technology and a rep firm experienced in this area would be helpful.

Television programming, on the other hand, may be quite easily handled as direct sales, at least in the beginning when things aren't too busy. Obviously, optimum marketing strategy will be somewhat different for every market; and since this is a rapidly advancing and constantly changing business, the project manager must be receptive to flexible planning.

Although this series has addressed itself primarily to the planning and implementation of common-carrier earth station facilities, many of the planning and construction considerations illustrated will also apply to single-purpose facilities such as those that might be established by TV broadcasters solely for their own use. Any readers who have had similar or different experiences in this area are invited to communicate with us so that we may share your knowledge. This phase of the communications industry is truly in its infancy and I expect that we will be exchanging stories and photos of our "babies" for some time to come.

BC

Decision Maker's Checklist

A. Construction Phase

- Early start prior to winter weather in colder climates.
- Proper drainage planned.
- Site security considered.
- RFI prevention steps taken.
- De-ice equipment ordered if required.

B. Initial Marketing Phase

- Distribute press releases.
- Activate mailing list.
 - Announce earth station construction.
 - Give estimated operational date.
- Develop expansion plan.
- Investigate rep firms.
- Investigate direct contact with local television.
- Check local cable operators for possible use.

M. Christoph

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PREVIEW



Technologies hold NAB '79 spotlight

By Ron Merrell, Editorial Director



It's closer than you think!

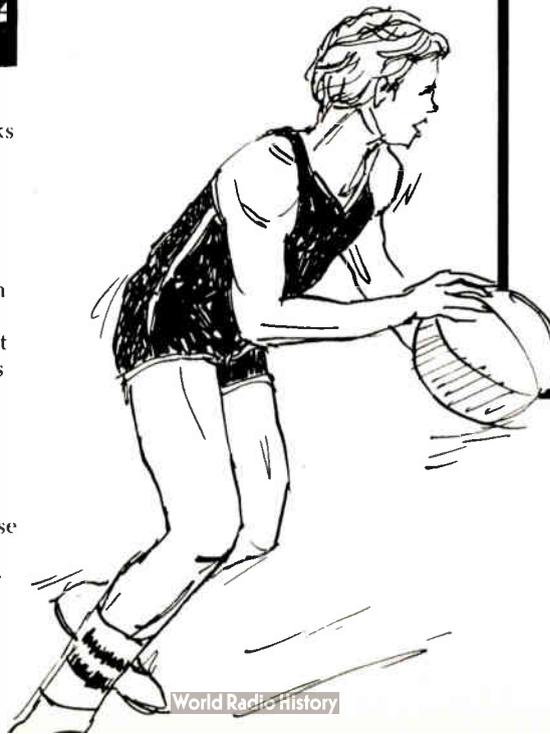
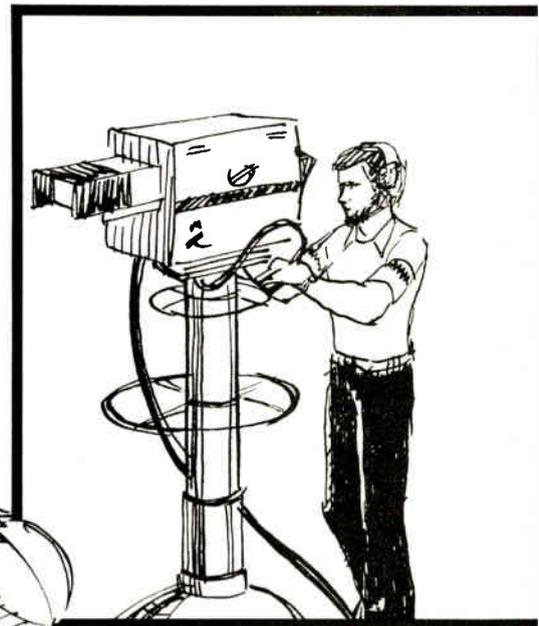
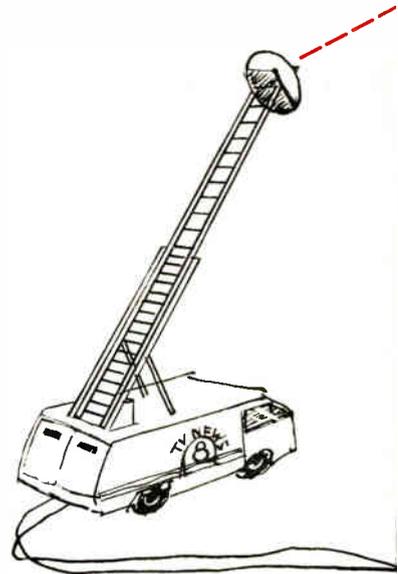
That's right, in just about six weeks the National Association of Broadcasters will open their doors on the 1979 version of their annual convention. And since it's being held in Dallas this year, it will come at least as a warm and welcome relief on the heels of another winter season.

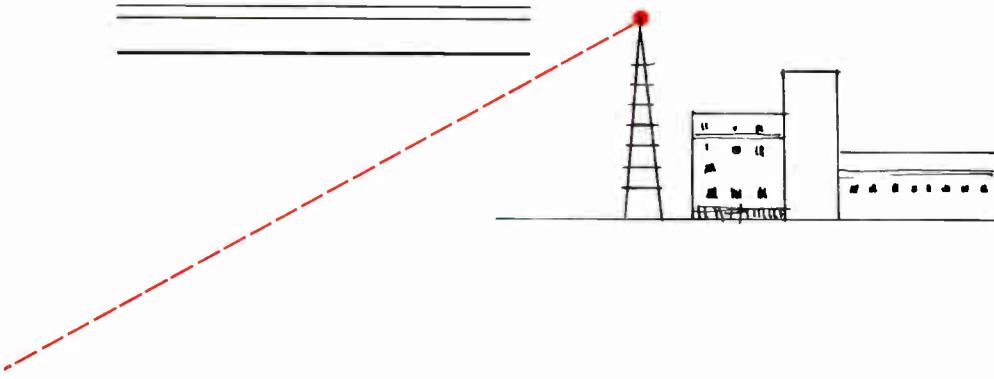
This time around there will be a lot more new and interesting innovations to cover in sessions, elevator conversations, and in the massive exhibit area. Probably one of the hottest topics will be the FCC hearings on teletext. For some time now, teletext has been in everyday use in England and France. And it's finding a receptive audience on other continents. But how about the U.S.?

In recent years, station KSL (Salt

Lake City, Utah) has been running right along with the state of the art, including the use of infrared links and fibre optics. And now they're concluding on-the-air tests of CP antennas and teletext. According to KSL, teletext holds great promise for even commercial stations. If you missed our teletext coverage, thumb back through the December issue to the KSL article and the report on the FCC hearing.

Meanwhile, the activity in fibre optics for broadcasters is very slowly gaining momentum, especially in the U.S. Broadcasters and most broadcast equipment manufacturers alike are taking a "wait and see" attitude. But





telephone companies and cable systems are steaming at full speed to take advantage of the unique signal-carrying capacity of the fibre cables. For an example of how fibre



optics can be used at the broadcast station, you'll want to review KWWL-TV's comments on how they use fibre optics for an ENG link. (See December issue of *BC*, page 38.)

While the rush isn't on yet, fibre optics bear watching because as research and development continue to meet the growing needs of cable and telephone systems, fibre optics will become economically and technically irresistible.

And speaking of irresistible, AM stereo still stands as AM's answer to FM for the 1980s. While development and implementation in the U.S. is hanging on the FCC's eventual selection of the most appropriate system, everyone (including the FCC) senses that it will be written into the rules in the near future.

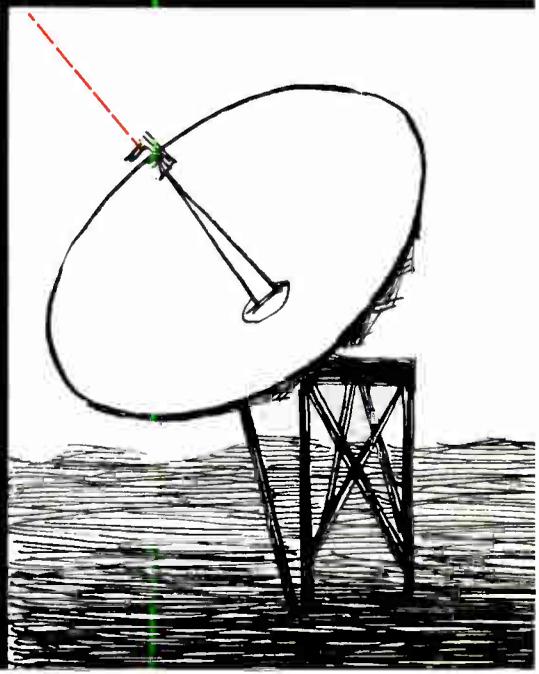
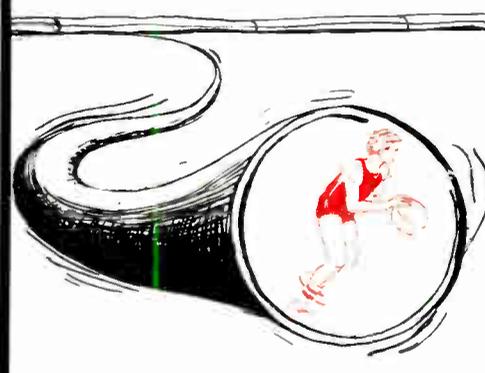
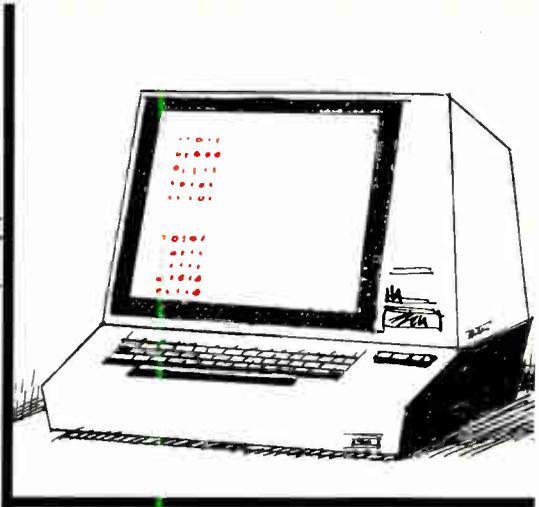
Of course, there's more to AM stereo conversion than a generator at the station and compatible receivers in the home. AM stations will need to make sweeping conversions to handle everything from stereo inputs to stereo outputs. Even the antenna needs to be considered, as Robert A. Jones pointed out in his article on broadbanding the AM antenna (*BC*, October, 1978) to accept stereo.

AM stereo undoubtedly will be touched on in a number of convention sessions, especially when FCC and engineering panels are scheduled. However, in some quarters feelings on AM stereo are mixed. While station managers will admit it will fire up their salesmen, others feel that AM stereo is a technical advantage; but content, ads, and formats have a greater effect on listeners.

At least two stations are testing AM stereo over the air in the past two months. Harris already has a system contending for acceptance, and now they have introduced an additional system. You can look for more on this system at their booth and in the sessions.

While it is still being talked about, stereo for TV is not getting much FCC time because the commission says there is no public (or broadcast)

Continued on page 46





pressure to move in that direction . . . yet.

At the 1979 NAB convention there will be a great many more people paying serious attention to what's happening in the development of satellite networks. Surely Ted Turner's Atlanta "Super Station" (WTCG) will head the list. Even stations not inclined to duplicate his satellite applications will see new possibilities through articles running in early issues of *BC*.

It hasn't come as a problem yet, but looming on the horizon is the possibility of satellite reception piracy. There is more than a passing interest in picking up satellite transmissions carrying CATV or broadcast programming. At least one major hardware manufacturer has asked the FCC to advise them on the legal implications of selling satellite receiving equipment to individuals for their personal use.

An FCC Section 605 reminder in the form of a public notice went into the U.S. mail back in September. It was brought on by the discovery that a cable TV system had picked up and used an ABC transmission which was not intended for airing at the time it was received.

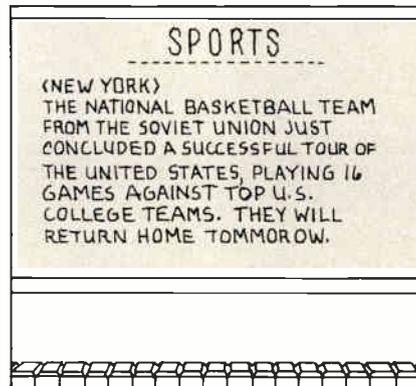
Since the satellite issues will be discussed in some detail during NAB sessions, it will be helpful to review the *Broadcast Communications* special satellite report in the November issue. The report gave examples of systems being built, and included an attack on the paperwork.

Just when questions on the FCC's rules involvement went from a dribble to a flood, the FCC announced it would open a docket to consider deregulation of earth stations. (See the FCC Report in the World Update section of this issue. Also in this issue, Dennis Ciapura renders part two of his series on how to manage your way into earth stations.)

Manufacturers and attendees alike will be thinking and talking more about distant ENG remotes. This has been prompted by many such remotes for sports and election coverage by the networks and a few local stations. This application emphasises ENG equipment flexibility and cost effectiveness. It also ignites the interest of competition in the commercial U.S. markets.

Of course ENG will be up front again, but this time mostly in the convention exhibit area. And that gets

us right into the vertical blanking problem. It shows up most often with multi-generation videotape from hetrodyne recorders. Apparently using a time base corrector before dubbing and editing doesn't solve the whole problem.



You'll hear lots of discussion on this subject, and one of the suggested answers is to use a digital synchroniser with a time base correcting input. Aside from the advantage of an infinite window of correction, synchronisers do not use an advance VTR lock adjustment. However, the subject will be on the front burner until we've solved the problem of what to do with those tapes generated with incorrect vertical blanking. You can look for black boxes in the convention exhibit for part of the answer.

The NAB has been actively involved in chasing down data on TV blanking by mailing a memorandum to all TV stations requesting assistance in developing data on TV blanking. The survey has been prepared by the broadcasters ad hoc committee on TV blanking, a group which has since become an NAB Engineering Advisory Subcommittee. First, of course, it is necessary for the FCC to understand the complexity of modern television studio operations and the inherent difficulty in making perfect synchronising waveforms for all possible signals.

Convention attendees should look for the FCC to cover the problem during at least one of the engineering panel sessions.

Meanwhile, microprocessor-based equipment is becoming more commonplace. Practical uses of the microprocessor is in the spotlight every month in this magazine. In the State-Of-The-Art section of the

November 1978 issue, Peter Burk tells how a microprocessor-based alarm system can be used to alert the engineer away from the station that a problem exists at the station. A dialer also will call him at home. If he can talk the problem through with an engineer at the station, an automatic alarm also will activate his beeper to indicate that the problem has been solved and the system is off and running again.

On the subject of digital, look for more news on the new digital audio systems. (See the October and November 1978 issues for updates by Dennis Ciapura.) *Broadcast Communications* will continue to monitor digital audio in the Audio Around The World section of the magazine.

Since we're moving toward the all-digital station, a good way to stay atop the technology is to review the Harold Ennes series on Digital Sight And Sound. Few sessions at the NAB convention will be tutorial, and those describing new equipment will be relying on prior engineering knowledge.

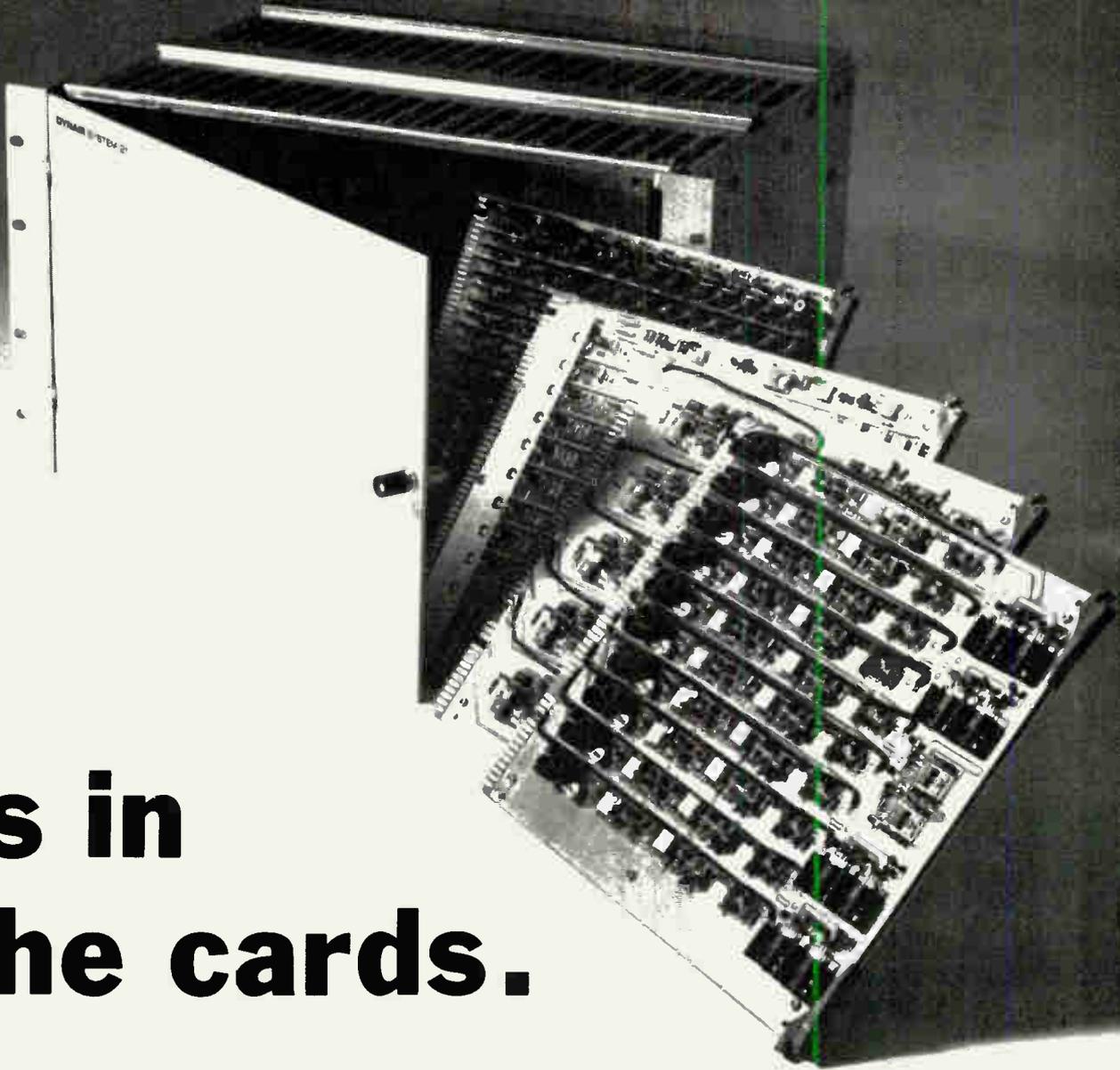
Digital video effects will continue to draw crowds as examples of its effectiveness becomes more and more obvious on network television. But don't look for a practical digital VTR to make an appearance this time around. And this brings us around to the production side.

In this issue of *Broadcast Communications* you get a behind-the-scenes look at how *Soap* is produced. Along with our cover story on French television using the one-camera or film-style approach, the *Soap* article brings up the latest techniques being used to meld film techniques and advantages with the flexibility and economy of videotape. The March issue of *Broadcast Communications* will include an article on the latest advances in lighting.

In another section of this issue, we've listed the sessions and exhibitors for the 1979 convention. There literally is something for everyone.

And convention time is closer than you think, so it's time to get registered. Registration for these conventions is hectic enough without registering late. For more information on hotels and advance convention registration, contact Convention Registration, National Association of Broadcasters, 1771 N Street, N.W., Washington, DC 20036.

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It's in the cards.

The solution to your next switching problem is probably built into one of our new System 21 cards.

We've unsnarled many a complicated distribution switching puzzle during our 22 years in the audio, video and data switching business. So, when we developed this new state-of-the-art system, we created an architecture that would let us move with cost-effective ease from 10 x 10 to 1000 x 1000 inputs and outputs.

What's your requirement? Our standard video cards in television broadcast applications offer specification numbers like 0.15% differential gain, 0.15° differential phase and ±0.1-dB frequency response to 5 MHz. Other video cards operate at 30-MHz bandwidths in high resolution environments.

Audio cards keep harmonic distortion under 0.25% at full 30 dBm output with hum and noise riding 105 dB below. They're balanced in and out and are protected against short circuits for an

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Cards are instantly replaceable with power on. They're controlled by a microprocessor with battery-backed memory so loss of power doesn't lose the matrix setting.

Controls, a variety of standard configurations, all operate on a single coaxial cable, or you might find our RS-232 port and your computer the best answer.

Yes . . . it's in the cards. We know we can be of assistance to you so call or write for additional information.

DYNAIR ELECTRONICS, INC.

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The annual ritual of evaluating broadcast equipment at NAB is serious (and big) business. It is also an exasperating business, considering the expansive acreage of floor space, the sheer number of exhibitors, the incredibly limited time, the crowded booths, and clogged aisles.

The station attendee heading to Dallas with a shopping list faces a familiar anxiety: *where do I even start looking?* This issue of BROADCAST COMMUNICATIONS unveils a new service called Personal Demo Request (**PDR**) that's designed to put BROADCAST COMMUNICATIONS readers who have specific buying interests in direct contact with NAB exhibitors who sell those products.

PDR is a service which allows exhibitors to contact you, at your request, before the convention begins in order to make date, time and location arrangements for a private, hands-on demonstration at the show. As such, **PDR** is also a means of making more efficient use of limited convention time, and avoiding the hassle associated with determining who sells what and locating their exhibit.

Two perforated **PDR** cards are adjacent to this page. Each card contains a list of the advertisers in this issue who have agreed to participate in this special service. Included, too, is the ad page location in this issue.

At the NAB convention . . .



**will put
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the head
of the
line**

Indicate with a checkmark the companies you want to be contacted by in order to arrange an equipment demonstration during NAB. Sometime prior to the show a representative from the companies you have checked will contact you by telephone or letter to arrange for an at-the-show demonstration.

The advertisers participating in **PDR** have agreed to cooperate by making prompt contact with NAB attendees who use this service. You can help by making sure your **PDR** card is mailed **no later than** March 9. Make sure, too, that you have affixed First Class postage (Air Mail if sent from outside the U.S.) and that you have included your name, address and telephone number in the space provided.

PDR is an exclusive service to BROADCAST COMMUNICATIONS readers. It was invented in response to mounting concern by broadcasters and exhibitors who feel the NAB exhibits have grown in size and number to the point that time and endurance prohibit delegates from seeing everything they want to see.

We think **PDR** is one answer and we hope you will use it.

Sincerely,

Michael D. Kreiter
Publisher

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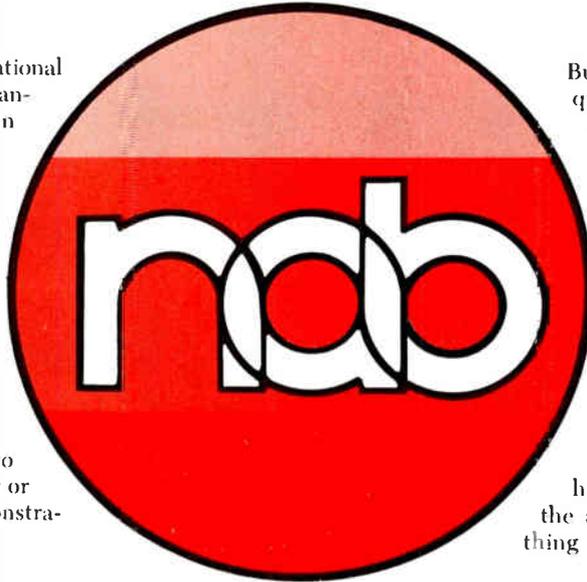
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The exhibit areas of the National Association of Broadcasters annual convention have been growing every year. This year there will be another record crop of exhibitors displaying their latest equipment and standard lines.

As a special service to convention attendees, *Broadcast Communications* is offering a unique service in this issue that is designed to help unsnarl some of the traffic in the exhibit areas. Far too many people get stuck in the aisles, waiting for the chance to be within earshot of the exhibitor or close enough for a hands-on demonstration.



But by using the Personal Demo Request (PDR) form, the convention attendee can arrange for a personal demo at the convention . . . putting the PDR card user at the head of the line.

The following is a list of exhibitors known to us at press time. If you've been eyeing a product advertised in recent issues, you'll want to make a note to yourself that the manufacturer will be exhibiting.

The March issue of *Broadcast Communications* will include special sections on sessions and exhibits. It is being designed to help the attendee take advantage of everything the convention has to offer.

EXHIBITORS

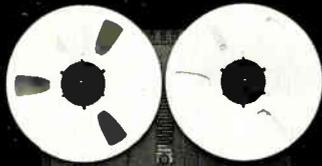
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Continued on page 52

OTARI BROADCAST RECORDERS



MX-5050-B

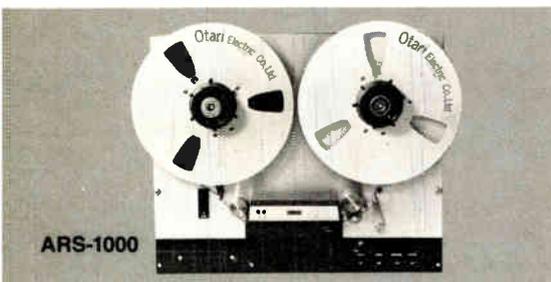
A complete line of professional tape machines (from one to eight tracks) built to meet the current and future needs of the broadcaster (including AM stereo) for long term reliability, high performance, full production capability, and backed by a new expanded program of parts and technical support.

MX-5050-B Compact Broadcast Recorder. Newest version of this field-proven two-channel machine, widely used in broadcasting worldwide. Three speeds, 24 dBm headroom, dc capstan servo, and modular construction.



Mark II

Mark II Broadcast Recorder. Separate transport and electronics for mounting convenience, plug-in card electronics, complete alignment accessibility. Two-channel 1/4-inch or four-channel 1/2-inch models.



ARS-1000

ARS-1000 Automated Radio Station Reproducer. Two-speed two-channel stereo reproducer specifically for automation systems. Ruggedly constructed for long term reliability and continuous operation.

Call Ruth Pruett at 415/593-1648 for your nearest Otari broadcast dealer.

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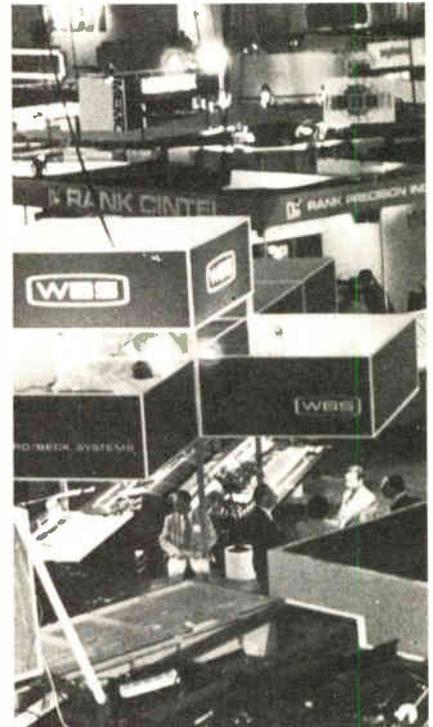
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SPECIAL
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Cine 60 Incorporated
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Colorado Video
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Comex Systems
Commercial Electronics
Compucon Inc.
Computer Image Corporation
Computer Magnetics
Computer Management Systems
Comrex Corporation
Comsearch Inc.
Concept Productions
Conrac Corporation
Consolidated Electronic Industries
Consolidated Video Systems
Continental Electronics Mfg. Co.
Convergence Corporation
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Groton Computer Inc.
HM Electronics
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Kings Electronics
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Knox Ltd.
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Laird Telemedia
Leitch Video Limited
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Listec Television Equipment
Live Sound Inc.
Logitek Electronic Systems
Lowel-Light Mfg. Inc.
MCI Incorporated
MPB Technologies
3M Company, Magnetic A/V Products Division

Continued on page 54

"this Auditronics 110 in the Louisiana Superdome..."



... handles over 80 events a year ranging in complexity from Saints football and NBA basketball, to the Spinx-Ali fight to rock festivals and religious revivals", says WWL's Hugh Burney, Director of Technical Operations. "Its 22-in by 6-out flexibility lets us use it for on-the-air TV and radio as well as network feeds, and some commercial production."

"We needed a board to handle a great variety of tasks at the Superdome, and we checked out half a dozen different brands. The stretched version of the Auditronics 110 gave us the greatest flexibility for the lowest cost, and they customized it for exactly what we needed. With Auditronics modular design, we essentially got a custom board with the quality we required for the Superdome at the price of a standard item."

"How does it work? Well, in two years on the air, it's done everything we've asked of it, and it's never failed in use. We like it well enough that we've since bought a second Auditronics 110 that's working eight hours every day in our commercial production studio."

If you'd like to know what WWL and over 300 other broadcasters and studios have learned about Auditronics quality and reliability, circle reader service number or call us.



Louisiana Superdome, largest indoor arena in the US, site of WWL's sports broadcast studio shown above.

3750 Old Getwell Road, Memphis, Tennessee 38118 (901) 362-1350

Circle (27) on Reader Service Card

OTARI MARK II BROADCAST RECORDER



A second generation recorder incorporating all the field-proven Otari features plus several new items of special interest to broadcasters. These include: modular transport and electronics for convenient console, rack or portable mounting, plug-in cards for ease of maintenance, splicing block, complete accessibility to all electronics adjustments for fast bias and record/reproduce alignment, variable speed ($\pm 7\%$) dc capstan servo to precisely match program length to a specific time slot, and interface jack for dbx or Dolby noise reduction switching. Standard Otari features include true professional quality and reliability, motion sensing, selective reproduce on all channels, 19 dBm headroom, XLR connectors, edit and cue, and built-in test oscillator. Available in two-channel $\frac{1}{4}$ -inch or four-channel $\frac{1}{2}$ -inch models.

Compare features and benefits, compare performance, compare our track record for reliability. Call Ruth Pruett at 415/593-1648.

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SPECIAL



PREVIEW

NAB exhibitors

3M Company, Mincom Division
Mach One Digital Systems

Marconi Electronics
Marti Electronics
Memorex Corporation

Continued on page 56

An invitation to broadcast engineers worldwide

By Vincent T. Wasilewski, *President, National Association Of Broadcasters*

You are cordially invited to attend the 1979 International Engineering Conference and Equipment Exposition in Dallas, Texas, USA, March 26 through March 29. Come to the United States and enjoy the comradery of the broadcasting fraternity with technical people from all over the world.

No matter what your area of broadcasting, be it miniaturising television cameras for field operation or giant multi-megawatt shortwave transmitting facilities, there will be displays and topics of interest.

Regardless of the country or political persuasion, the technical facilities of broadcasting stations all have a common objective, to serve the largest number of people in the most effective and efficient manner. And every year technical progress is made in many of the special areas of broadcast technology.

This year more than ever before we expect visitors from outside the United States to come to the convention in Dallas and attend the technical sessions, scour the exhibit floor for information on equipment, and meet and greet other engineers in the hospitality suites. It is the fascinating conversations with other broadcasters, especially those from other countries, that can make the convention experience most rewarding. The broadcasting objectives may be similar, but the engineering approaches may vary widely. A standard practice in one country might become a new innovation at your broadcasting facility after chatting with technical personnel from across the waters.

This year, for instance, we have a workshop on teletext and other TV ancillary signals. Teletext might be new to the U.S., but some of the foreign visitors could be very helpful to us by relating their experience with the digital ancillary signal transmissions.

Satellites now provide a daily handshake from nation to nation and on the agenda is a session entitled "Engineering Principles of Communications Satellite Systems." For many who have marveled at the accomplishments of satellites but who have not yet had any direct experience, the session is designed for you. In an hour and a half, this workshop will take you from neophyte to local expert in one easy lesson.

Those around the world that originate or retransmit television programmes for U.S. consumption should be brought up to date on the latest policies and practices on blanking. It has become so serious that a number of programmes could not be carried on U.S. television because of excessive blanking widths.

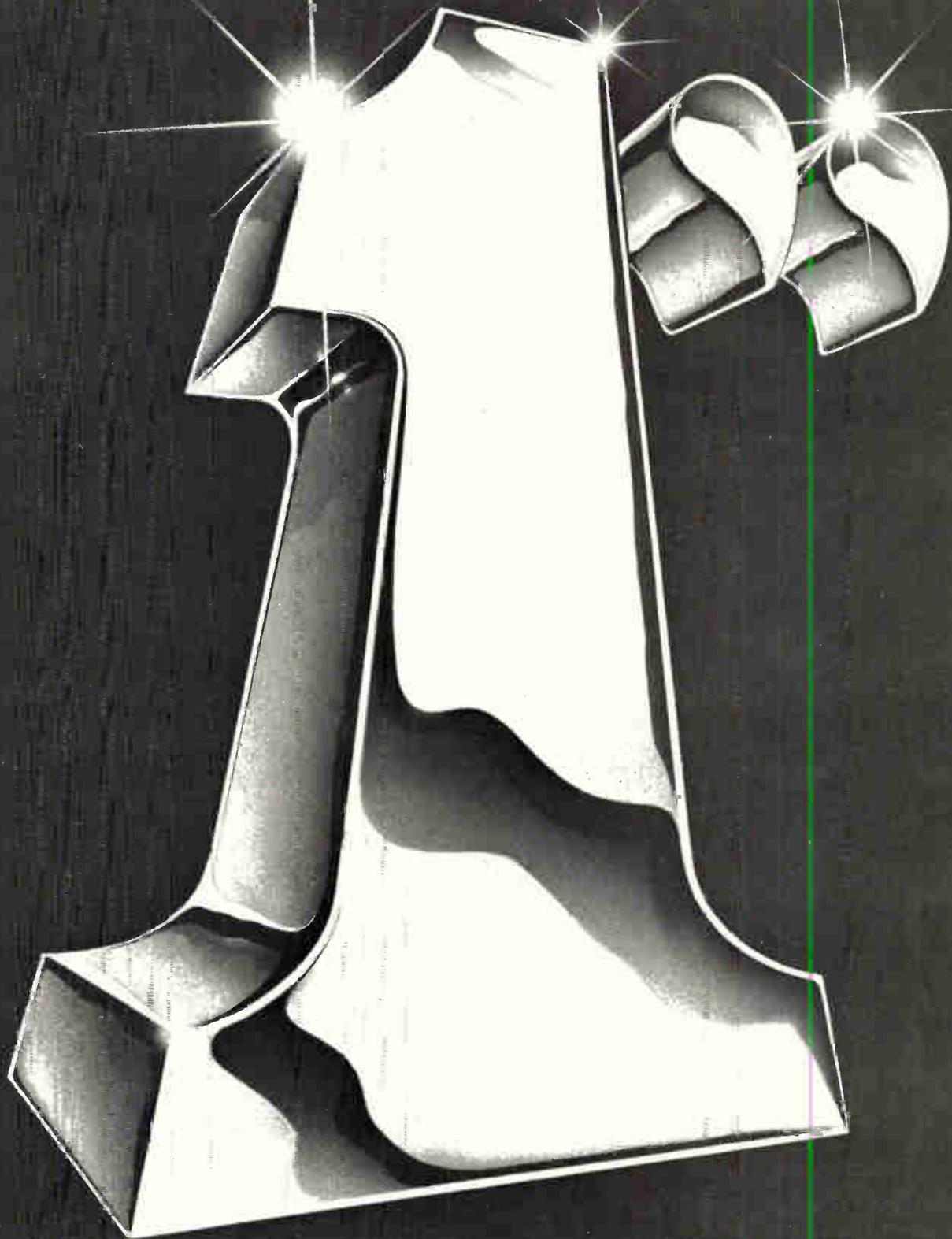
Another fascinating presentation of universal interest is the NBC preparations for the 1980 Summer Olympics in Moscow. The "Grand Remote" will be a feat in international broadcast diplomacy, incorporating the highest levels of planning, system design, and operational skills.

Radio broadcasters will be interested in the U.S. progress with AM stereo, and in radio receivers from a manufacturer's viewpoint. The manufacturing and marketing of radios has become a multinational operation, and the perceptions of those in the business should be of interest to broadcasters from all nations.

The state of the art in audio magnetic recording has advanced rapidly and there should be considerable interest in the workshop on "Audio Cassette, Cartridge and Reel-to-Reel Tape Performance."

A workshop will discuss and enlighten everyone on "The Absence of Radiation Hazards in Broadcasting," another issue of worldwide interest.

We hope our international friends will find ample justification in our offerings to make the trip to Dallas well worthwhile. We look forward to seeing you there. Welcome to NAB 1979!



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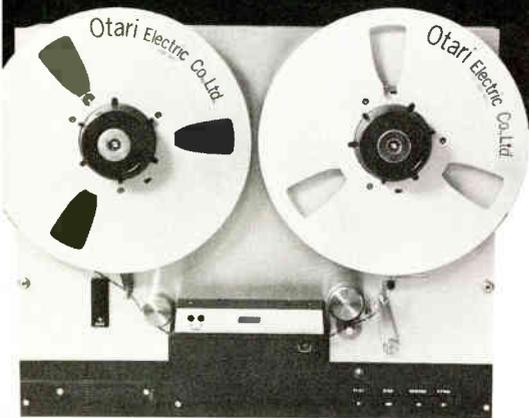
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Full agenda for radio, TV, engineering conference

By Michael Scheibach, Managing Editor

The 1979 edition of the NAB convention will open Sunday afternoon, March 25, with a welcoming address by Donald Thurston, NAB board chairman. Following presentation of the association's Distinguished Service Award, NAB President Vincent Wasilewski will speak on "Broadcasting: The Year Ahead."

This year's convention again will feature a full agenda of important sessions, workshops, paper presentations, and panel discussions for both management and engineering personnel.

Television Engineering. The engineering conference will get underway Monday, March 26, with a workshop of particular importance to U.S. broadcasters: Teletext, Closed Captioning and Other Television Ancillary Signals. This workshop will review the work going on both in the United States and internationally on systems for encoding additional signals in the visual and aural transmissions of television stations.

A discussion of the production and post-production experience with one-inch videotape machines and digital television is being moderated by the Society of Television and Motion Picture Engineers (SMPTE).

Other workshops being held Monday are Television Blanking Progress Report; The CBS Blanking Width Corrector; The TK-47 Auto-Cam Camera; and Amateur Radio Operators Reception.

Tuesday, March 27, opens with a workshop on Digital Editing and Special Effects for Television, an update on the use of digital technology in post-production techniques.

A special paper presentation, titled

"Replacement of Slow Motion With One-Inch Tape," is scheduled for 10:30 a.m. It will cover the use of one-inch tape machines for slow-motion applications.

Completing the Tuesday engineering agenda will be a workshop on The Absence of Radiation Hazards in Broadcasting, a joint workshop for radio and television engineers. This discussion will focus on the effects of non-ionizing radiation in relation to microwave transmitters from a governmental, industrial, and public relations viewpoint.

Wednesday, March 28, opens with a workshop on Broadcast Tall Towers: An Aeronautical Hazard? Because of the increase in the construction of tall towers, the FAA has started proceedings into the matter which might affect future construction. This workshop should be especially important to television engineers.

The emphasis turns to the Olympics with a paper presentation entitled "Engineering Preparations for the 1980 Olympics." The paper will describe the technical and operational considerations NBC must deal with prior to airing the Moscow games.

Television Management. On the management side, scheduled workshops will cover all aspects of a station's operation: programming, management, economics, government guidelines, ratings, production, and personnel.

In the Box will consist of three mini-debates on the hottest subjects of the year:

- Resolved: The FTC Should Regulate Children's Television Advertising;

Tweed Audio (USA) Inc.
 UMC Electronics
 U.S. Tape & Label Corp.
 Unarco-Rohn, Division of Unarco-Ind. Inc.
 Uni-Set, Division of Kniff Woodcraft Corp.
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 United Research Lab. Corp.
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 Video Data Systems
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Videotek Inc.
 Vital Industries
 Vitex Division/Vital Industries
 Ward-Beck Systems Inc.
 The Webster Group
 Western Union Telegraph Co.
 Wilkinson Electronics
 The Winsted Corporation
 Wolf Coach Inc. (Television Eng. Corp.)
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• Resolved: Television Stations Should Pay Substantial Spectrum Fees;

• Resolved: Television Channels Should Be Set Aside for Use by Minorities.

Guest panelists will take part in these debates, which should prove to be an interesting "show" for those attending.

For women in broadcasting, there will be a session on minorities and women moving into top-level broadcast management positions. A related session, *The Managerial Woman*, will feature several experts discussing whether this "new" woman is really a different breed.

The Radio and Television News Directors Association (RTNDA) will host a session on *The Use of Investigative Teams in TV News*. RTNDA experts will discuss how to establish and maintain investigative teams in your news departments. Special emphasis will be placed on the use of investigative reporting to improve your station's ratings.

Ratings will also be the subject of another session, *How to Use Television Ratings*. Representatives from Arbitron, Nielsen, and other services will provide advice on making the best use of ratings. John Dimling of the NAB is scheduled to take part.

BPA experts will explain how ENG is being used for PSAs and other local promotion at a session called *Promoting Your Station Using ENG*.

Other television sessions include *FCC Rules and Policies You Must Know*; *Living with Wage and Price Guidelines*; *Localism . . . Alternative to Syndication*; *Creative Selling in 100 Plus Markets*; *Can Research Improve Your News?*; *How to Use Television Ratings*; and *More Effective Communication Thru TV Commercials*.

In addition, Lionel Van Deerlin, chairman of the House Communications Subcommittee and principal author of the Communications Act re-

write, will moderate a discussion on *Television and the Rewrite*.

Radio Engineering. The radio engineering agenda gets underway Monday morning with a workshop on *Audio Processing: Test, Measurement and Monitoring*. Other workshops scheduled for Monday are *Engineering Principles of Communications Satellite Systems*; *AM-FM Receivers*; *The Manufacturer's Viewpoint*; *AM Stereo Broadcasting*; and *Amateur Radio Operators Reception*.

To prepare engineers with the latest information on adapting transmitters for AM stereo, soon to become a reality in the U.S., a special paper will be presented on the topic Monday afternoon. The paper will discuss incidental and extraneous phase modulation, bandwidth of RF networks, design objectives, and phase response of AM amplifiers.

A seminar on *Audio Cassette, Cartridge, and Reel-to-Reel Tape* will open the Tuesday conference. This discussion will cover the present state of the art in audiotape and magnetics, and will offer recommendations for its practical use at stations.

Microprocessor-Based Cartridge with Open Reel Quality is the subject of a paper to be presented Tuesday morning. The presentation will include a description of microprocessor-controlled logic, cue tone, and detection. Improved headroom, transient response, and intermodulation distortion will also be covered.

Wednesday opens with a workshop on the planning, contracting and purchasing of radio station facilities. Following this session, a paper will be presented on *directional antenna phasors*, with emphasis on improving the bandwidth of a complicated antenna system.

Radio Management. Before your station begins constructing that new facility, attend *Next Time We Build*

One of These . . ., a workshop designed to minimize those construction "blunders." Construction experts will give tips on how to avoid the repeated costly errors like console positioning, windows vs. no windows; how much heating/air conditioning; what about lighting; sound conditioning; and construction dollar conditioning.

Here's a sampling of other radio sessions:

• *Whatever Happened to Old What's His Name?* Tips on finding the right person for the right job — and keeping him.

• *That Automation Unit Has More Personality Than My Morning DJ*. A mini-course on the "dos and don'ts" of automation from broadcasters "doing it right" in selling, programming, and engineering an automated station.

• *Community Involvement Can Increase Your Numbers*. NAB's Darryl Dillingham moderates this session on how a station can improve its image, audience, programming, news, and pocketbook by getting in touch with the community.

• *Formats — An Exclusive Session for Radio Managers Who Also Wear a Program Director's Hat*. Need we say more?

• *I Will Buy More Radio If . . .* A panel of leading U.S. advertising personalities explain how to get more national radio dollars.

In addition to the TV, radio, and engineering conferences, which run concurrently during the convention, the NAB plans special sessions just for spouses. Also, "The Mate's Place," staffed by people who know Dallas, is a complete information centre open daily during the convention.

Registrants at NAB '79 may attend any sessions — TV, radio, or engineering. For more information on these meetings, contact Dos Schuette (202-293-3587) at the NAB.

WLTA hockey remotes score high in stereo

By James Gantner

"... the crack of a hockey stick hitting the puck from the left speaker; a scramble on the ice from the right speaker; he shoots! ... he scores! ... and the sound of the crowd surrounds the listener!"

Coverage of a sporting event can be simply that: a straight reporting of the game. But, when WLTA-FM agreed to carry the games of the Atlanta Flames, we decided to do more than just broadcast the play by play. We wanted to give the listener the feeling of actually being there — by broadcasting the games in stereo.

The Flames play their home games in the Omni, a modern coliseum which will seat about 15,000 people. The ice surface

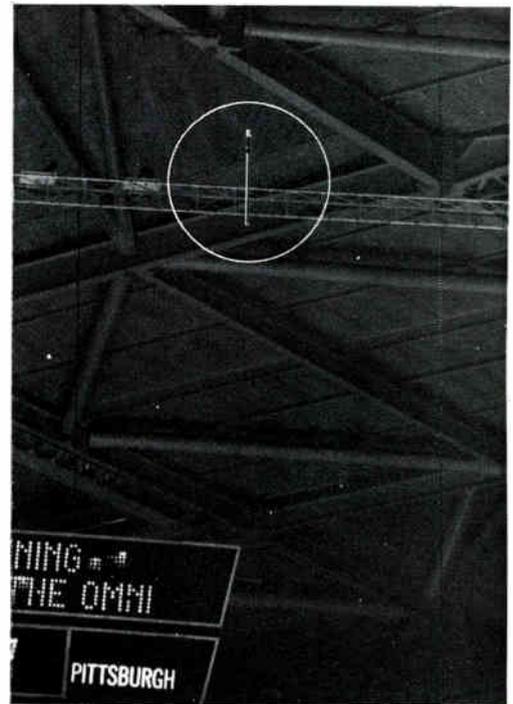
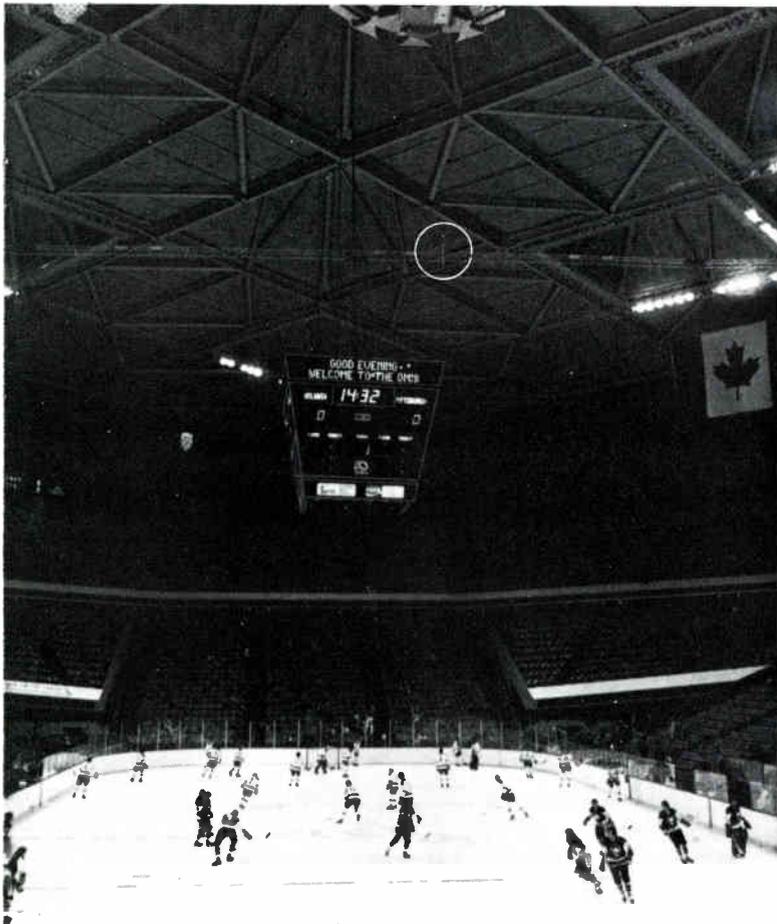
is an oval measuring 85 by 200 feet. Surrounding the rink is a wall of metal and Herculite ranging in height from six feet on the sides of the oval to 10 feet on the ends. The ceiling of the Omni is a network of pyramid-shaped pods 150 feet from the floor.

We decided to point two shotgun microphones at the ice to create a stereo action effect. There were two ways we could mount the microphones: either mount them on the wall surrounding the rink or suspend them from the ceiling.

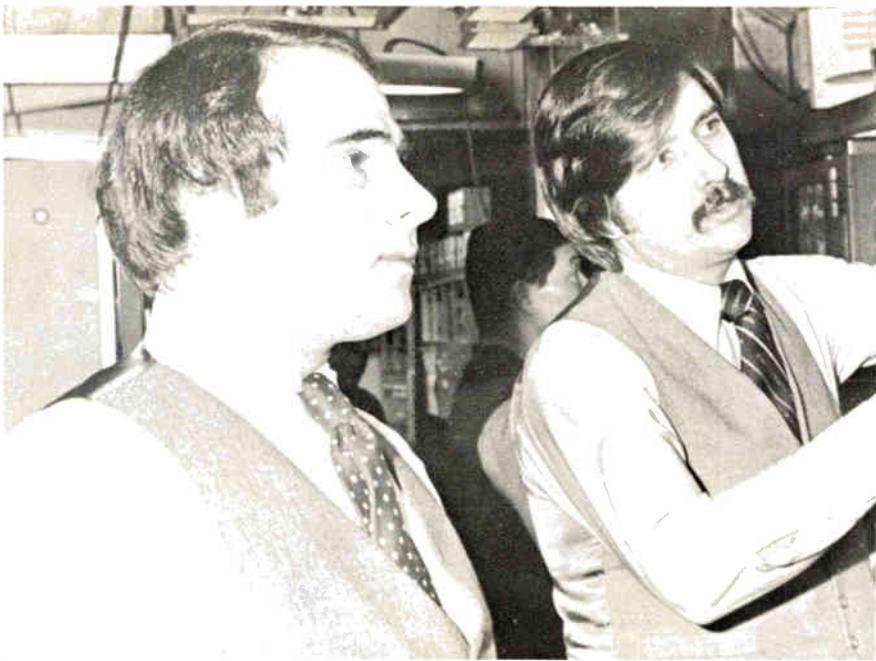
Mounting the microphones on the rink walls created several problems. During the hockey season, the Omni is also used for rock concerts and basketball games. At these times the hockey rink is dismantled and the ice is covered. This would mean that the microphones would have to be set up and taken down for each game. There also would be problems

Continued on page 62

James Gantner is joining WSB, Atlanta, this month as an FM engineer. He was formerly an engineer with WLTA, also in Atlanta.



To create a stereo action effect, WLTA hung two shotgun mikes from the ceiling just 40 feet above the surface of the ice. By using shotgun mikes, placed one-third of the way in from each end of the rink, the listener can actually hear the sound of the puck being hit by the stick as the players move across the ice.



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“The TDF-1 has given us a consistent air look and higher overall quality - better than network ...

“It really makes life easier — it improves the signals that need improving and leaves the rest alone . . .

“We did a side-by-side test with a competitive unit, which we thought was pretty good, but when we brought the TDF-1 in — well, somebody had sure done their homework on it! It especially handles film grain better . . .

“It’s fabulous on cartoons! By the time you run the TDF-1 up to its top correction, you end up with a signal that has no grain . . .

“I haven’t seen anything it doesn’t handle well.”

— Jim Gonsey
Chief Engineer
KPLR-TV, St. Louis, Missouri



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Hockey remotes

running cables to the microphones since there are no conduits or wiring troughs to the wall locations.

Hanging the microphones from the ceiling also created problems. Although there are catwalks on the bottom of the pods that make up the ceiling, getting from one pod to another requires a certain amount of acrobatic skill. It would also take more cable to hang the microphones from the ceiling. What's more, the National Hockey League regulations would not let us hang the microphones any closer than 40 feet from the surface of the ice. After weighing the pros and cons of both methods, we chose to hang the microphones from the ceiling.

We decided to hang the microphones over the "blue lines," the lines on the ice that mark the teams' defensive zones. This location would place the microphones one-third of the way in from the ends of the rink. From the pods above the blue lines a cannon connector was installed on each cable. From there, with the help of Omni personnel, the cables were snaked through steel pipes and "walked" along "I" beams to the sides of the coliseum. The cables were then dropped down to cable runways and into the broadcast booth, a distance of about 300 feet per cable.

Next, separate 100-foot cables were made. The microphones were connected to these lengths, and these cables were connected to the cables already installed. These cables were made detachable for two reasons. First, it was easier to cut the cables to length on the floor and install connectors before installations. Secondly, these sections of cable would be the locations where possible broken connections could occur. It would be easier to remove these cables for repair, rather than making the repairs up on the pods. (I'm not too crazy about having to install cannon connectors 150 feet in the air.)

Belden 8428 was used for the microphone cables. Belden 8428 is a heavy-duty cable with a neoprene jacket, providing good durability. It is also strong enough to support the microphones without having to use any additional cables.

AKG D-900E shotgun microphones were selected for the "ice mikes." The shotgun pattern gives us enough directivity to pick up sounds from the ice while not being overpowered by crowd noise. The walls surrounding the rink, along with the hard ice surface, "directed" the sound of the players on the ice up to the microphones. This gave us excellent microphone pickup.

An extra plus that came from installing the two shotgun mikes was that the listener can hear the sound of the puck being hit by the stick. In fact, the careful listener can hear the players calling for the puck or shouting encouragement to their teammates. Any time you get into the sports scene live, there is the possibility that a player's language during a tense turn in the action could be embarrassing. Fortunately, most players are Canadian and do most of their game talking in French. Understood or not, this extra dimension for sports coverage helps put the listener near the ice with great rink-side perspective.

The console we selected to use at the Omni is a Yamaha PM-430. The PM-430 is an eight-input, stereo-output console with equalisation and panpots on each input. This allowed us to "pan" the announcers off of stereo centre if necessary; and, in general, make the programme sound the way we want it before it gets to the studio.

We also decided to do a post-game show from the Flames' locker room. This was accomplished by using a "dry" telco pair from the locker room to the broadcast booth along with a Shure SM-82 line-level microphone.

From the Omni the programme is carried on 15 kHz stereo telco loops to the WLTA studios. At first we were going to monitor the air signal from a receiver at the Omni. But due to possible FM multipath problems we elected to run a mono

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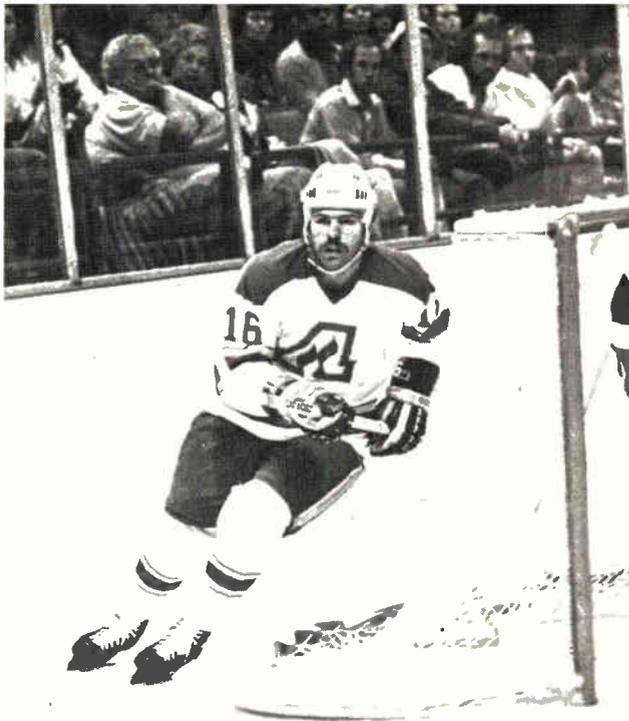
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own out-of-town origination. Through the Robert Wold Company we were able to get quality audio satellite feeds for all but four of the games. These mono feeds from WTCC and the Wold Company were processed through an Orban 245E stereo synthesiser before being broadcast on the air.

Satellite audio feeds are becoming more and more commonplace. And it didn't escape WLTA-FM engineering and management that if we wanted to keep our audio quality high, we'd have to get involved with satellite audio remotes. The bandwidth via satellite is excellent, but you should be aware that if there is audio degradation once the signal is received at an earth station down terminal, that same degradation could be passed along to the station. In other words, delivery from the earth station to the station can be critical.

Listener reaction to stereo hockey broadcasts has been very good. Besides providing excellent quality audio, people are amazed by hearing the action shift from one speaker to another. And who knows, with the advent of stereo AM broadcasting, the transmission of mono sporting events may become a thing of the past.

Editor's Note: Telco interest in fibre optics could alleviate much of the site-to-studio audio degradation problem. A 3 kHz voice grade circuit on AM is bad enough. Used for an FM remote, it is downright distracting.

If your station has solved some of those nagging remote broadcast problems, or added a production technique that improves the sound and image of your station, drop a line to the Editor. We'll help you share it with the world broadcast community. The address is: P.O. Box 12268, Overland Park, Kansas 66212.

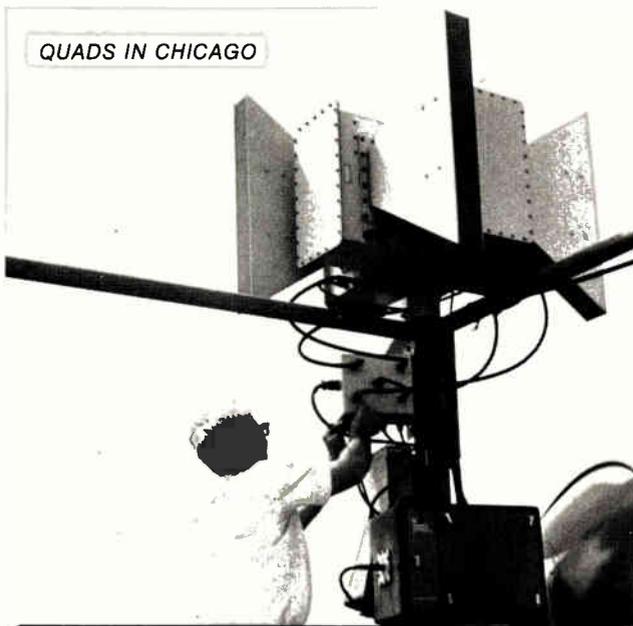
BC

air feed from the studio back to the Omni.

The Flames play 40 games at home and 40 away. The major concern on away games was the quality of audio, since a 3 kHz voice grade circuit is of marginal audio quality on an FM station. From the games that were broadcast on television, we were able to pick up excellent quality audio feeds from WTCC-TV. The games that were not televised required our

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Digital Sight and Sound

Don't get jittery about sampling

By Harold Ennes

You know how ugly a beautiful oil painting can look when examined close-up. Like an oil painting, digital technology is full of snags, traps, and other uglies. We need to step back occasionally and look at it from a distance. Details only become useful when the overall objective (picture) is in sight.

So let's take a few minutes and look at a typical system application of digital techniques for television broadcasting. Figure 9 gives an overall view of an in-plant application that is adaptable to almost any of the reasons for a digital system in the TV studio. Keep this block diagram handy throughout the rest of this series. It will serve as an orientation in the location of specific system functions.

Basic In-Plant Digital System. As shown by Figure 9, the source can be any synchronous or non-

Harold Ennes, Digital Editor, is the author of several digital texts.

synchronous composite signal. If originating in the studio, it can also be non-composite as long as it has the associated colour burst. It can, for example, be the poorest signal imaginable from a helical-scan video recorder with heterodyne colour and all the attendant jitter. Note that the storage (memory) write-in clock is formed from the separated burst of the signal source. As the video jitters, so does the write-in clock — and by an exactly corresponding rate and direction. In this way, a given sample pulse will always be associated with a given sampled level on the analogue signal, and stored in the memory bank. The stored information will be independent of jitter.

Now comes the beauty of the digital system. The highly stable local sync generator originates a "read-out" clock so that all of the jittered signal source stored in the memory will now be raster and colour-locked to every other stable signal source in the studio. This has been accomplished without the need for gen-

locking the local sync generator. As you know, it would have been impossible anyway to genlock from a jittery signal.

We have just described, in essence, how a digital time base corrector (DTBC) works. When used for time base correction, the required memory capacity is a maximum of 4 to 6 TV lines. When used as a field synchronizer, memory capacity in digital form is slightly over one field, or approximately 1.5 million bits. Sometimes sync and blanking are not stored, only the video from the end of colour burst to the start of the next horizontal sync pulse. A frame synchronizer requires a memory capacity in digital form of slightly over one frame, or approximately 3 million bits. More on this subject in future sessions.

The Sampling Carrier. Figure 10A represents a given analogue input signal. Figure 10B shows that this input signal is applied to an electronic switch driven by a narrow sampling pulse. This means that the input signal is

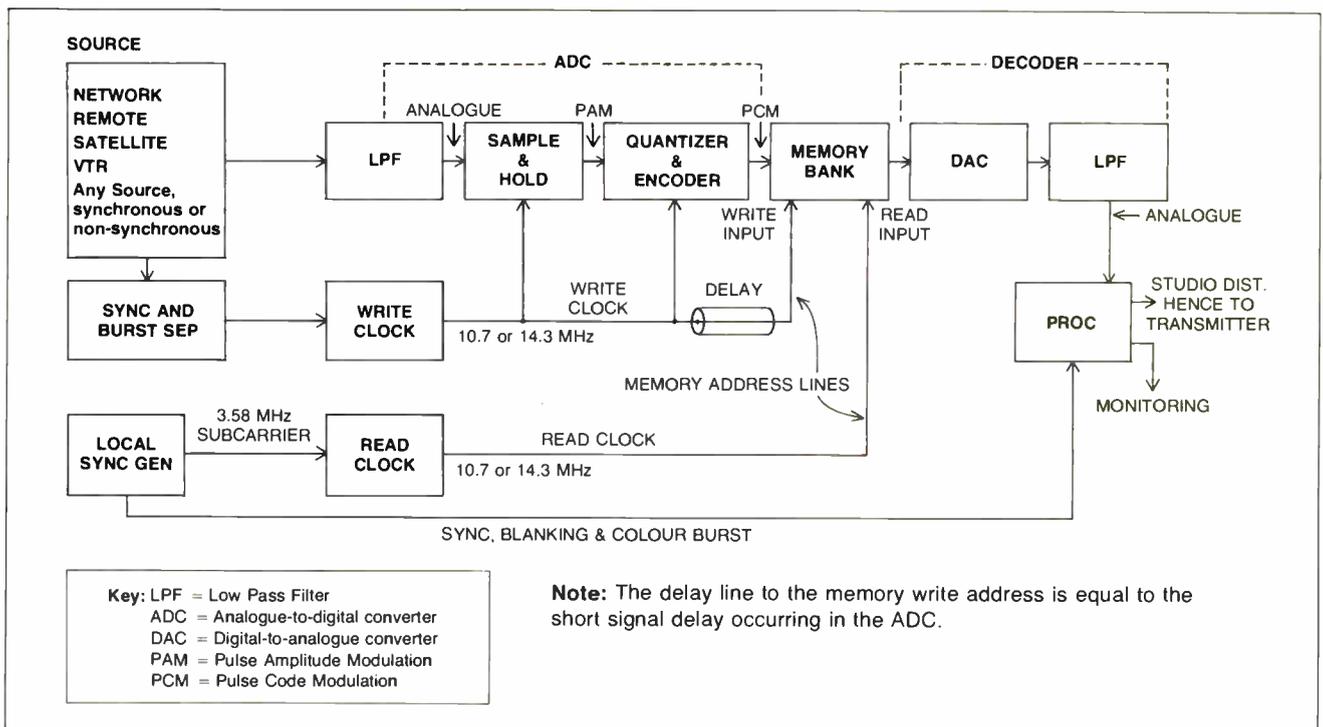


Figure 9 Simplified block of basic in-plant digital application for TV. Each block will be described in future sessions of this series.

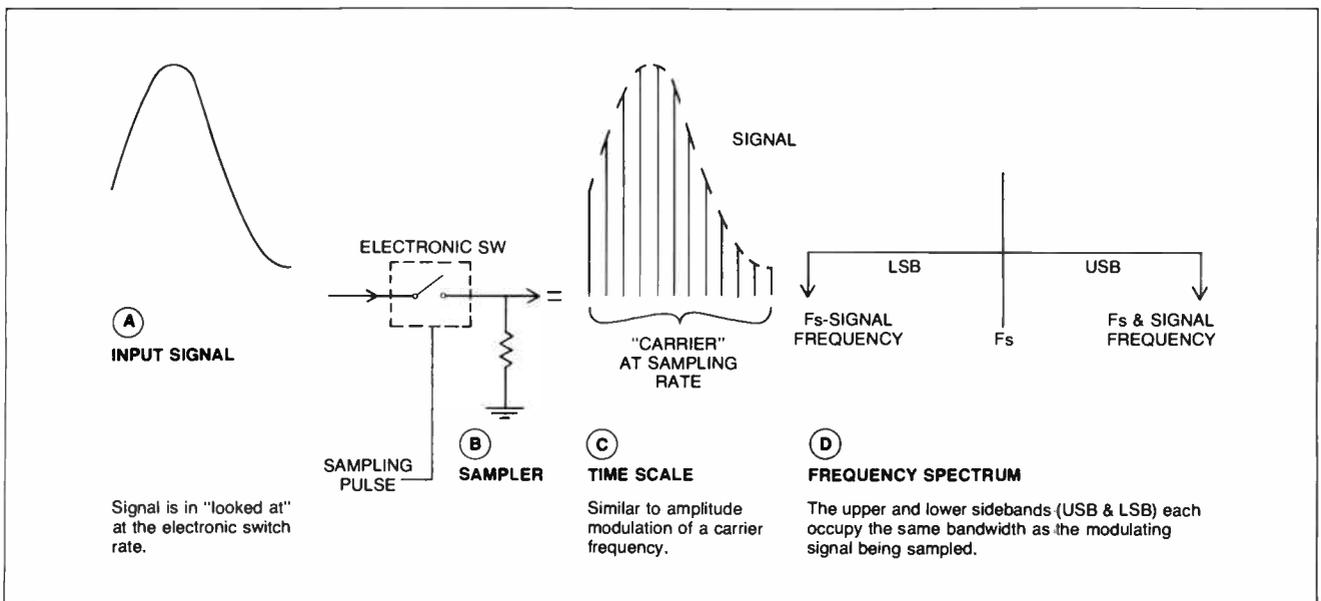


Figure 10 Basic characteristics of a sampled signal.

interrupted at the sampling rate and appears as in Figure 10C. Note that when the sampling rate is much higher than the applied signal, we have an "envelope" created by the sampling carrier modulated by the applied signal; very similar to amplitude modulation of an RF carrier. Figure 10D shows this similarity in the frequency domain where upper and lower sidebands exist around the "carrier frequency" determined by the sampling rate. The lower sideband limit is the sampling frequency f_s minus the highest signal frequency, while the upper sideband limit is f_s plus highest signal frequency.

This information can be translated to the drawing of Figure 11A where the highest video frequency (f_v) is assumed to be 4 MHz, and the sampling frequency (f_s) is just twice this frequency or 8 MHz. Then $f_s - f_v = 8 - 4 = 4$ MHz. To avoid overlap with consequent generation of spurious frequencies, an infinite filter cutoff would be required, which we know is impossible in practice.

Figure 11B shows what actually happens. If the video low-pass filter is flat to 4 MHz and has a practical rolloff, we may still have some energy at, say, 4.4 MHz. The Nyquist Criterion says that the highest video frequency (f_v) should be $f_s/2$. If a 4.4 MHz signal is being sampled (modulated), this signal is $f_s/2 + 0.4$ MHz. The signal would be recovered erroneously as $f_s/2 - 0.4$ MHz = 3.6 MHz, or 0.4 MHz below one-half the sampling frequency rather than 0.4 MHz above, where it originated. This is the same as crosstalk interference in and around the critical colour subcarrier frequency, and is termed "aliasing"; frequency beats in the picture that cannot be removed by conventional filtering. Elaborate transversal comb filters would be required, and some compromise

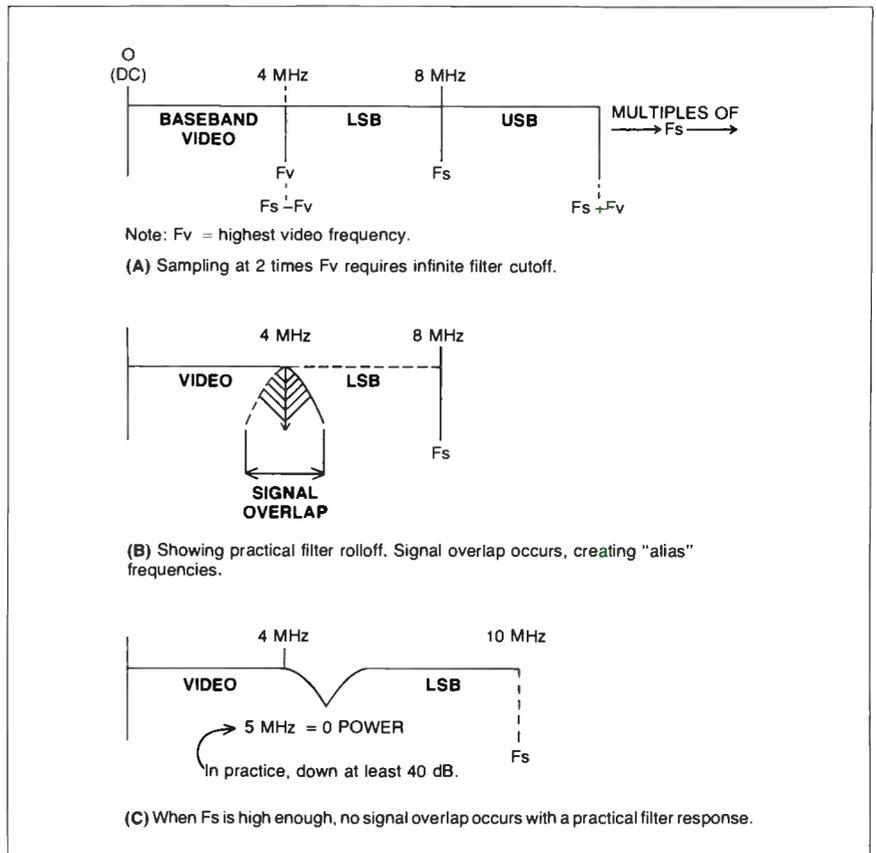


Figure 11

would be necessary in picture quality.

The practical solution is to move the sampling frequency far enough above the highest intended video frequency that a practical filter response can be used. In Figure 11C, the sampling frequency is 10 MHz. Therefore, any video response at 5 MHz above should be zero; in practice, at least 40 dB down. The low pass filter ahead of the sampler (Figure 9) must prevent any response above 4.2 MHz that approaches one-half the sampling frequency. An f_s of 10.7 MHz is

practical; an f_s of 14.3 MHz is even better. Due to the steepness of filter rolloff, a subcarrier second harmonic trap (7.16 MHz) is normally required as part of the filter design.

Reviewing Figure 10C, you will note that the height of each individual pulse represents the amplitude of the original signal at the instantaneous sampling time. This is known as pulse amplitude modulation (PAM). In our next session, we will look into actual sampling techniques.

UNITED STATES

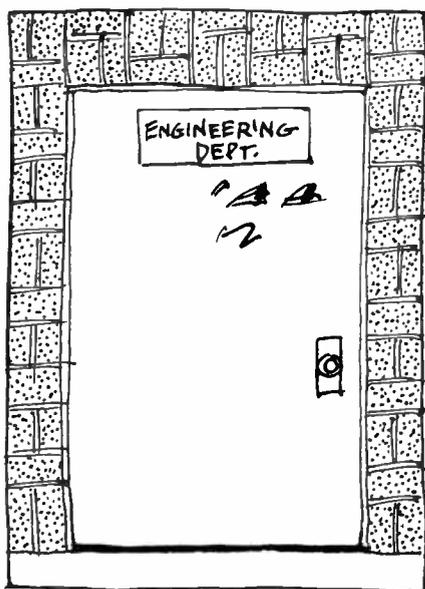
Bridging the philosophy gap

By Steve deSatnick

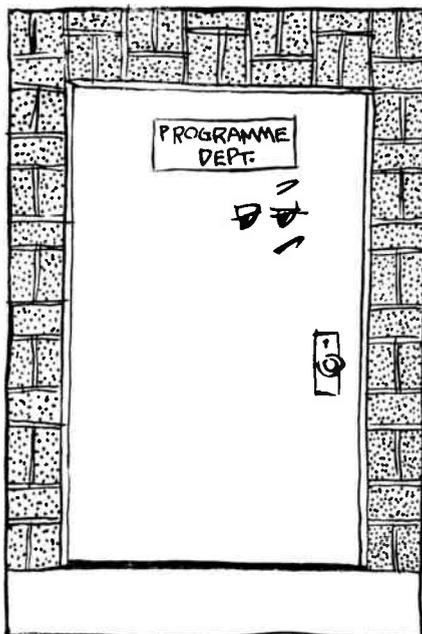
Some programme people consider broadcast engineers merely as "service" personnel. But engineers must try to change this view by banding together.

Does a credibility gap exist between engineering management and other management forces within a broadcast facility? Perhaps a credibility gap is not the problem; perhaps what exists is really a philosophy gap. There is a distinct difference in the philosophies embraced by most programme people and those espoused by most engineers.

Programme departments, and indeed in some cases general managers, continue to demean engineering departments because of a lack of understanding of what engineering departments are and what they do. These people cannot relate to microfarads, picofarads, or any other technical jargon. They only want to know if we can give them a quad split, a soft wipe, a downstream key, a freeze frame, etc. Sure, someone's supposed to know Ohm's Law, the FCC Rules, digital technology, and the like, but the fact that the engineer is the one who feels at home in these areas gains him little respect from the programme or news departments. If a common ground for coexistence is to be found, it is first necessary to understand the persons and the problems on the other side. This is not to say that this is not a two-way street.



Steve deSatnick is director of operations and engineering, KCET, Los Angeles.



The dedicated broadcast engineer is likely to be something of an idealist who has a strange curiosity and a very creative urge. Because of this underlying idealism, he is not satisfied with a system which merely works; it must work at its best — as close to perfection as its design and the state of the art permit. This translates into professional pride. Whenever he's denied the time or the funds to maintain a broadcast facility in an up-to-date professional manner, his frustrated idealism breeds dissatisfaction.

At the same time, the engineer has got to face the fact that his department is no longer cock of the roost. Fortunately or unfortunately, the engineering department has become a service department which, along with such other ancillary departments as art or production, services the programme department. Like it or not, that's the way it is. The programme department supplies; and all other service departments deliver.

The era of the engineering department's purchasing the equipment to meet all of the station's needs is over. Today, both the technology and the design of state-of-the-art equipment is oriented toward the programme department. This includes news

departments which I encompass as being part and parcel of delivering the product to the screen. The only time an engineering department gets noticed is when there's a technical problem or when there's been a mistake. The more proficient we are at forestalling such crises, the less we are counseled. Thus, the better we are, the easier it is for everyone else to overlook our expertise, even though it is what we do that literally gives the station a voice to sell!

You bet, we must keep abreast of up-to-the-minute technology, because if, through our "mundane" tasks of installing, maintaining, and operating equipment, we fail to deliver what programming requires, the engineering department goes right down the tube. But what if, on the other hand, we, as engineers, could cultivate the ability to coordinate all the separate interests of our stations' personnel into effective team efforts? If we could get others to play down the unrealistic emphasis on the comparative importances of the various departments, mightn't we come closer to operating our facilities at levels which more nearly approach their full potentials?

I think there should be an industry-wide effort among engineers to band together and be unified. This doesn't mean to begin a range war. When fragmentation exists between departments which is typical within the industry it becomes extremely discouraging. We must spend our energies in enlightening people as to what an engineer is and how they really function.

UNITED STATES

CP antennas put to the test

KSL reports on tests recently concluded on the effectiveness of circularly polarised antennas to combat multipath and ghosting in poor reception areas.

This month we received a statement from Bill Loveless at KSL-TV, Salt Lake City, that should be of more than passing

Continued on page 68



USERS REPORT: VMI HEAD LIFE GOES UP!

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interest to those at TV stations still pondering the commitment to circularly polarised (CP) TV transmitting antennas. The following is a summary of the tests recently concluded at KSL by the engineering staff.

Primarily, the report concerns itself with tests to see what possible benefits there might be from CP antennas in poor reception areas of a station's coverage. While these views, along with other forwarded in this column each month, do not necessarily represent the editorial opinion of *Broadcast Communications*, they do come from stations that have an engineering reputation for running side by side with the state of the art.

"We began our tests for the purpose of evaluating the installation of a CP transmitter in the Bonneville International Corporation's Seattle, Washington television outlet, KIRO. We conducted tests in the Salt Lake Valley because we happen to have two similar high-band VHF stations with transmitters located at the same site. Both are public television stations, and so both broadcast materials from the same sources. However, one

station uses a CP transmitter and the other employs the traditional HP (horizontal polarization) transmission mode. Thus we were able to conduct the tests under actual broadcast conditions and in a wide variety of receiver locations, including open areas, urban high-rise building areas, mountainside areas, and others.

A five-element yagi cut for channel 11 was mechanically phased 90 degrees in front of a five-element vertical yagi on the same boom. A remotely switchable phasing system was used to switch the CP antenna feeds between vertical, horizontal, right-hand circular, left-hand circular, and a separate rabbit ear antenna. The rabbit ear, mounted atop the mast, was adjusted midway between channels 7 and 11 carrier strength on a field meter with elements set 45 degrees from vertical.

The KSL tests results say that in their good reception areas the CP signal delivered the expected "double power" signal strength on the CP receiving antenna with excellent picture quality and no ghosts. However, the KSL report states,

"... at the poor reception sites where ghosts and multipath are visible, the channel 11 CP signal on the CP receiving antenna did not reduce ghosts and multipath reflections. In fact, the conventional HP channel 7 had the strongest signal with the least ghosting of all the antenna combinations, including rabbit ears."

According to the KSL report, ghosts can be produced by a CP signal reflecting from a poor conducting dielectric surface such as concrete, asphalt, brick, dirt, rock, mountains, trees, water, grass, and apartment and office buildings. These ghosts "... cannot be cancelled by a CP receiving antenna."

The report says that "the electromagnetic laws of physics and CP theory may be used to explain and predict the poor results obtained in the CP tests in the multipath areas. The same laws and tests also confirm the conclusions reached by panel 9 of the National Television Standards Committee when in 1941 it observed that horizontal polarisation was superior to vertical polarisation in regard to multipath and ghosts." **BC**

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NAB features new equipment

For more information on new gear listed in Product Premier, just use BC's convenient Reader Service Card.

It's that time of year when manufacturers are gearing up for the unveiling of another round of new broadcast equipment. And with the record number of exhibitors (more than 300 this time) already scheduled for booth space, you can expect a record number of product introductions.

The Product Premier section of *Broadcast Communications* is our open invitation to view the latest products being offered to the industry. And if you want further information on any of these (or those in any issue), simply make a note of the number that follows each product heading and circle that number on our Reader Service Card in the back of the issue.

After processing, your request is sent directly to the manufacturer. Other "circle" numbers are used for almost all ads

appearing in this magazine each month. By using these numbers, you can get information quickly on advertised products.

If you are not planning to attend the NAB convention (March 25-28), you will miss the interesting sessions, but not the spec sheets and additional information you need for comparing products. Properly filed and kept up to date, information acquired from circling numbers on the Reader Service Card each month will be a valuable aid when equipment purchase decisions need to be made.

Let's get started with our February product introductions with a unique unit from Comrex.

Radio remotes extender (Circle 56)
COMREX — A unit designed to improve audio quality of audio telco remotes.

Called a Low Frequency Extender, the unit recovers the usual loss of the bottom end 250 Hz.

At the remote site the unit heterodynes the bottom 250 Hz up. Then at the receiving end, another unit shifts this 250 Hz back down, giving a more complete and recognizable audio (voice) signal.

The portable extender transmitter (about the size of a cassette recorder) has an input for either a microphone or a recorder, making it convenient for use on dial-up phones at some remote site.

As a bonus, the unit removes from the line all noise below 250 Hz. The mike input is slightly hotter than the recorder input so that voices can be done over a taped background without having to assemble the tape back at the station.

Continued on page 70

The Complete FM Stereo Processing System



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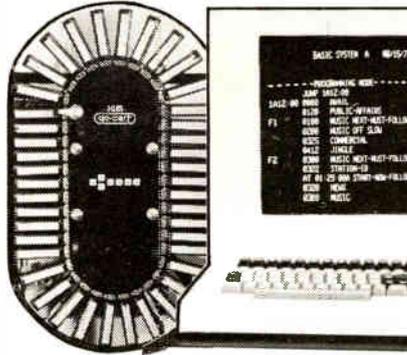
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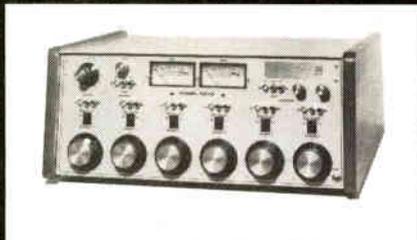
HUMAN ENGINEERED. Whole unit swings open for maintenance, even while on air.

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Circle (40) on Reader Service Card

Premier

15-track TV audio (Circle 51)

THE btx CORPORATION — A new SMPTE interlocking system, the btx 4500, expands video production capacity to include outboard multi-track audio recorders.

Any recorder of any speed or format with or without servo capstan drive can be precisely locked to any VTR to enhance TV audio flexibility. This system allows sweetening, overdubbing, re-recording, editing, and recombining to a time base accuracy within 50 microseconds of absolute mechanical lock.

The 4500 synchroniser is a microprocessor-based system using standard SMPTE time code.

Time code center (Circle 52)

GLENTRONIX — The company is distributing the TELCOM generator, reader, and calculator integrated grouping that adds up to a flexible Time Code Center.

If the operator is synchronising audio and video tapes with differing time codes, the Time Code Center can change one of the time codes by any amount to permit use of a conventional synchroniser.

Designed for rack mounting, the options include a remote-control keyboard that can be located up to 1,000 feet from the Center, and a character generator, a plug-in module which provides a video display for all functions.

Another option is a large keyboard which can be used with the character generator for titling, operator prompting, and tape identification.

Reader/gen/synchroniser (Circle 53)

MCI — The company has made autolock a reality with the JH-45, a microprocessor-based unit designed to meet SMPTE and EBU specifications.

According to the company, the JH-45 faultlessly locks audio/video, video/audio, and film/audio. Transport controls include high speed, lock fast, auto rec. and lock. A front panel readout shows hours, minutes, seconds, and frames. Slave status lights indicate retard, locked, and advance conditions.

Front panel controls include: Gen Start; Gen Stop; User Bits; Off Set; Park; and microprocessor entry keys.

Low-cost timers (Circle 54)

ES ENTERPRISES — Featured by the company is their ES-300. It's a 100-minute timer (\$99.59) with six controls, including count up, count down, minute set, second set, stop, and reset. The displays are incandescent.

The ES-500 is a six-digit, twelve-hour combination clock and timer. Extra fea-

tures include fast advance and slow advance.

Standard options on these timers are slave; BCD output; six-foot remote cable and pushbutton set; relay closure at zero and/or stop at zero. Custom options are available. The ES-300 is listed at under \$190, and the ES-500 at \$166.

Tape cart machines (Circle 55)

BROADCAST ELECTRONICS — The Spotmaster 3000 series comes supplied with Nortronics Duracore® heads and a low-voltage current-regulated solenoid. These units have an independent azimuth adjustment, while cartridge brand is interchangeable.

They feature a wide record input range, solid-state switching, and auto/manual fast forward options.

A headphone jack is included for maintenance, and a microphone input is an available option.

Editing system (Circle 57)

DATATRON — The Tempo 76 editing system has been designed to interface with over 40 makes and models, including Sony, JVC, Ampex, IVC, Bosch, and 3M.

The Tempo 76 features include Varascan slow motion, reverse, freeze-frame viewing, an expandable edit event memory, motion control, and servo sync of up to three VTRs.

The system also has optional high-speed punched paper tape and printer peripherals, a text editing option, and system debugging.

Field strength meter (Circle 58)

POTOMAC INSTRUMENTS — The new FIM-71 field strength meter is designed for use in FM and TV field strength tests, with an overall range of from 45 MHz to 225 MHz through continuous tuning. Peak or averaging detector is switch selectable. A choice of AM or FM demodulator also is switch selectable.

The calibrated dipole included can be mounted on the case for near-ground measurements or removed for TASSO measurements.

The FIM-71 has a 140 dB measurement range, and it will measure FM harmonics to -80 dB. A calibrated signal generator is built-in, and it covers 45 MHz to 225 MHz.

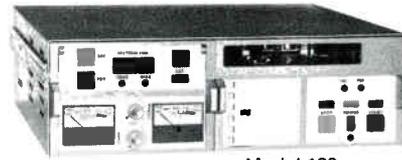
Two-channel recorder (Circle 59)

OTARI — Several new features are built into the MX-5050-B reel-to-reel recorder, including its low price. The unit uses TTL/IC logic for noise-free punch-in and punch-out, and a return to zero feature for mix down.

Switch selectable from three standard

Continued on page 72

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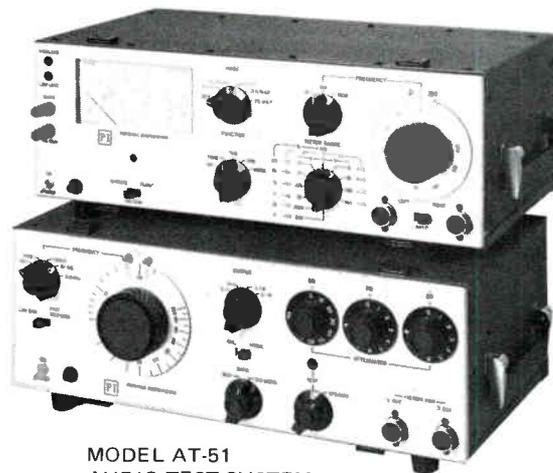
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USE



PAGE 48

Premier

speeds, the MX-5050-B has 24 dB head-room, with 28 dBm maximum output. And there are three switch selectable calibrated record levels: 185, 250, or 320 nWb/m. It also uses peak-reading LEDs plus standard VU meters.

The recorder was designed with a DC capstan servo standard, with $\pm 7\%$ speed control in both record and reproduce. The MX-5050-B sells for just under \$2,000.

Weather monitor (Circle 60)

HEATHKIT — A computerised automatic weather station monitor is available in kit or factory-wired versions. The weather monitor includes a time/date six-digit display, wind vector and wind speed, thermometer, and four-digit barometer.

The microprocessor-controlled unit includes some unusual features such as automatic wind-chill readout; recall of the time of maximum and minimum temperatures; auto recall of the date and time of wind speed and direction; and date and time of maximum or minimum barometric pressure. In fact, the unit will calculate automatically the rate of barometric pressure change per hour.

Called the ID-4001, this unit includes windups, weather vane, and an infrared outdoor temperature sensor. And in case of a power failure, the ID-4001 can be connected to an external battery.

In kit form, the unit is \$370, and the factory wired version is \$595.

Edit-Aid (Circle 65)

VIDEO AIDS CORP. OF COLORADO — The EDIT-AID unit (model QUAD-AR-1) can programme edit-in and edit-out functions on any VTR that has editing ability and a cue audio track. EDIT-AID units control the moment of editing by applying pulses to the existing cue audio head. Pulses from the EDIT-



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AID unit are recorded on the cue audio track of the videotape. The electronic pulses are retrieved during playback; and through the EDIT-AID unit, the edit-in and edit-out functions are performed.

These units can be rack-mounted directly on the front panel of your quad VTR. A cabinet model is also available.

The N4152 TWTA operates over the frequency range of 5 to 10 GHz; the N4153 TWTA operates over the frequency range of 7 to 18 GHz.

Typical applications for these instrumentation amplifiers include satellite ground station transmitter driver units; laboratory measurements; electro-magnetic and RF interference testing; antenna test patterns; and intermediate power amplifiers.

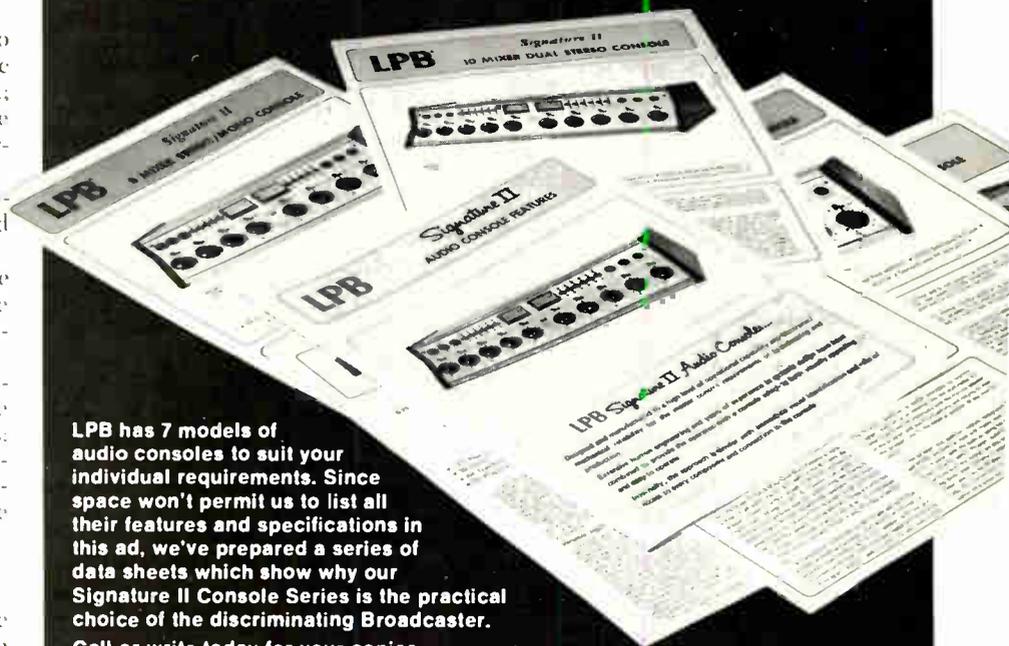
Cartridge machine (Circle 62)

INTERNATIONAL TAPETRONICS — The new 99 Series audiotape cartridge machine will be introduced at the NAB convention next month in Dallas. The 99 Series utilizes computerised control, the latest solid-state electronics, and advanced features to provide reel-to-reel sound from cartridge tapes.

In addition to the 99 Series, the company will feature its other lines of cartridge machines: its full line of reel-to-reel machines, including the 750 and 550 recorder/reproducers and the 750 reproducer only for automation applications; and production models of the 1K cartridge system. The 1K, available for inspection at NAB, is a computerised system that receives, stores, moves, and plays up to 1024 tape cartridges in any pre-programmed format.

Amplifiers (Circle 61)

ENGLISH ELECTRIC VALVE (EEV) — Two lightweight and compact 1-watt
Continued on page 74



LPB has 7 models of audio consoles to suit your individual requirements. Since space won't permit us to list all their features and specifications in this ad, we've prepared a series of data sheets which show why our Signature II Console Series is the practical choice of the discriminating Broadcaster. Call or write today for your copies.

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World Radio History

Travelling Wave Tube Amplifiers (types N4182 and N4183) are now available. The amplifiers are based on PPM focused metal-ceramic, helix structure TWTs.

Timing control (Circle 65)

PVH ELECTRONICS LTD. — The new TCU-1 timing control device is an economical, expandable clock system with a built-in programmable time event generator. Its LSI MOSS technology is packaged in a steel, all-welded, rack-mountable frame with a hinged-down front panel.

The TCU-1 offers as standard features two time bases with an internal crystal oscillator, automatic time base switching, and full battery backup. The unit is capable of providing up to four separate time events per 24-hour period.

NEC cartridge VTRs

CINEMA PRODUCTS — Now available are two cartridge VTRs manufactured by NEC, Japan: the TTR-5 and TTR-7 one-inch helical broadcast format "D" video-tape recorders.

Both machines are fully compatible, utilising NEC's advanced self-threading



cartridge design. The TTR-5 and TTR-7 modular construction allows easy in-the-field replacement of video head cartridges.

The TTR-5 was designed for light studio use, mobile van or fixed location remotes where studio-type flexibility of outputs and monitoring are desired with the portability of a broadcast-quality ma-

chine. The TTR-7 was designed exclusively for portable operation. It is a lightweight, over-the-shoulder unit weighing under 33 pounds, including tape and battery.

For further information, please write to Cinema Products Corp., 2037 Granville Avenue, Los Angeles, CA 90025; (213) 478-0711 or 477-1971. **BC**

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| <input type="checkbox"/> A. Commercial TV Network | <input type="checkbox"/> M. Independent Program Producer |
| <input type="checkbox"/> B. Government-operated TV Network | <input type="checkbox"/> N. Recording or Sound Studio |
| <input type="checkbox"/> C. Commercial Radio Network | <input type="checkbox"/> O. Educational, Public or Religious TV |
| <input type="checkbox"/> D. Government-operated Radio Network | <input type="checkbox"/> P. Educational, Public or Religious Radio |
| <input type="checkbox"/> E. TV Station | <input type="checkbox"/> Q. Corporate, Industrial or Medical CCTV |
| <input type="checkbox"/> F. AM Station | <input type="checkbox"/> R. Consulting Engineer |
| <input type="checkbox"/> G. FM Station | <input type="checkbox"/> S. Systems House |
| <input type="checkbox"/> H. AM & FM Station | <input type="checkbox"/> T. Importer, Exporter, Dealer or Distributor |
| <input type="checkbox"/> I. TV & Radio Combination Station | <input type="checkbox"/> U. CATV Multiple System Operator |
| <input type="checkbox"/> J. International Shortwave Radio | <input type="checkbox"/> V. Government Official or Agency |
| <input type="checkbox"/> K. Satellite or Microwave Relay | <input type="checkbox"/> W. R&D or Design Engineer |
| <input type="checkbox"/> L. Teleproduction Facility | <input type="checkbox"/> X. Other _____ |

2. YOUR JOB FUNCTION

- | | |
|--|---|
| <input type="checkbox"/> 1. Corporate Management (President, Vice President, Owner, Partner, Chairman, Chief Executive, etc.) | <input type="checkbox"/> 3. Programming & Production (Program Manager or Director, Producer, Production Manager or Director, Editor, Lighting Director, etc.) |
| <input type="checkbox"/> 2. Technical Management & Engineering (Chief Engineer, Technical Director or Supervisor, Vice President in Charge of Engineering, Recording Engineer, etc.) | <input type="checkbox"/> 4. Other Station Management & Administrative Titles |
| | <input type="checkbox"/> 5. Other _____ |

3. YOUR PURCHASING AUTHORITY

- | | | |
|--|--|--|
| <input type="checkbox"/> A. Full authority to buy | <input type="checkbox"/> C. Recommend make, model or brand | <input type="checkbox"/> 1. Immediate interest |
| <input type="checkbox"/> B. Specify or approve purchases | <input type="checkbox"/> D. No purchasing authority | <input type="checkbox"/> 2. Future reference |

4. REASON FOR YOUR INQUIRY

1. Immediate interest (see Special Service)
2. Future reference

NAME _____ TITLE _____

COMPANY, STATION or AGENCY _____

STREET ADDRESS _____

CITY _____ STATE or PROVINCE _____ ZIP or COUNTRY CODE _____

TELEPHONE (_____) _____

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1. TYPE OF COMPANY OR FACILITY (Please check only one)

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| <input type="checkbox"/> B. Government-operated TV Network | <input type="checkbox"/> N. Recording or Sound Studio |
| <input type="checkbox"/> C. Commercial Radio Network | <input type="checkbox"/> O. Educational, Public or Religious TV |
| <input type="checkbox"/> D. Government-operated Radio Network | <input type="checkbox"/> P. Educational, Public or Religious Radio |
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2. YOUR JOB FUNCTION

- | | |
|--|---|
| <input type="checkbox"/> 1. Corporate Management (President, Vice President, Owner, Partner, Chairman, Chief Executive, etc.) | <input type="checkbox"/> 3. Programming & Production (Program Manager or Director, Producer, Production Manager or Director, Editor, Lighting Director, etc.) |
| <input type="checkbox"/> 2. Technical Management & Engineering (Chief Engineer, Technical Director or Supervisor, Vice President in Charge of Engineering, Recording Engineer, etc.) | <input type="checkbox"/> 4. Other Station Management & Administrative Titles |
| | <input type="checkbox"/> 5. Other _____ |

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- | | | |
|--|--|--|
| <input type="checkbox"/> A. Full authority to buy | <input type="checkbox"/> C. Recommend make, model or brand | <input type="checkbox"/> 1. Immediate interest |
| <input type="checkbox"/> B. Specify or approve purchases | <input type="checkbox"/> D. No purchasing authority | <input type="checkbox"/> 2. Future reference |

4. REASON FOR YOUR INQUIRY

1. Immediate interest (see Special Service)
2. Future reference

NAME _____ TITLE _____

COMPANY, STATION or AGENCY _____

STREET ADDRESS _____

CITY _____ STATE or PROVINCE _____ ZIP or COUNTRY CODE _____

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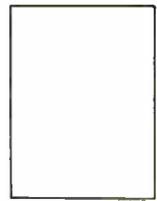
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